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Selecting Spring Materials

Gas Fluxing of Secondary Aluminum

Oxygen Accelerated Combustion

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The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 5 AUGUST 4, 1947

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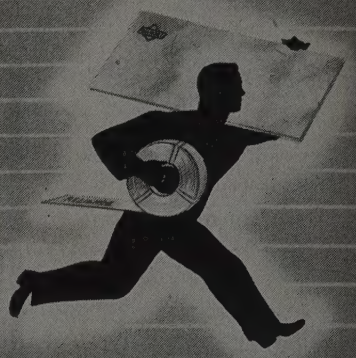
It's Gotta Fit...



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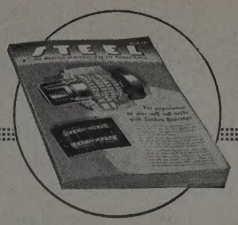

August 4, 1947

The Hard Way

In the week that has elapsed since the first session of the 80th Congress recessed, many commentators have essayed to appraise its record. If any competent observer has given it unqualified praise, we have failed to note it. In most instances critics have rated the legislators' performance as "disappointing or fair" or "moderately good, considering the circumstances."

These restrained appraisals are not surprising in view of the conditions prevailing since the session convened last January. Congress has labored under the difficult situation wherein one party retains hold of the executive department while the other has majorities in both houses of the legislature. A second factor is the obstinate behavior of Russia on postwar world problems. This introduced possibilities of American commitments in the foreign field so unpredictable as to cost and duration that Congress was forced to modify some of its objectives in the domestic field.

In view of these considerations, one may ask whether the record of this session is as good as we had a right to expect. Would we have been better off if we had a system whereby we could avoid having a President of one party and a majority in Congress of the other party? If we had a government on the British or Canadian pattern, the action of the American voters last November would have caused the Truman administration to step down and the victors to assume control in all branches of the government. Would this have been good for our nation?

We believe not. The events of the past seven months furnish convincing evidence that our American Constitution, with its provisions for checks and balances, again has proved its worth.

If the "vote of confidence" procedure had prevailed in the United States, the vote of last November would have precipitated a wholesale evacuation of public office holders who had been in power since 1933. The "outs" would have come in in force and there would have been a violently abrupt shift from left to right.

As it was, the pendulum was prevented from swinging too far too fast. We have made moderate progress in getting away from some of the dangers of the New Deal. Such progress as we have made is more likely to be retained than if we had pursued more drastic methods of change.

Ours may seem to be the hard way, but in the long run it always has proved to be the surer and better way.

o o o

PRICING, STEP BY STEP: If the price advances for steel products announced recently are more drastic than had been expected, it is because attention has been centered so much upon the effect of the coal wage settlement that other factors contributing to higher costs have been minimized or overlooked.

Since Jan. 1 five events have affected costs in steel. First was a 17 per cent increase in freight rates. Next was the wage boost of 15 cents an hour for steelworkers. Third was the much publicized coal wage settlement. Fourth was the sharp rise in prices of steelmaking scrap. Fifth was the increased cost of numerous goods and services purchased by steel producers.

Even if the coal factor were ignored, there would have been justification for increases in steel prices. In relation to prewar levels, steel still is priced lower than many commodities.

The degree of advance may cause some persons to yearn for a return of government control of prices. This view overlooks the significant fact

(OVER)

that the nation still is in the process of shifting from a planned to a free economy. The conditions which now contribute to a hike in prices sometime hence will be contributing to lower prices.

Apparently we have to go through this painful cycle in order to wind up eventually at the realistic levels dictated by the law of supply and demand.

—pp. 59, 137

* * *

NOVEL KIND OF AGENCY: Industry will watch with interest the formation and development of the National Science Foundation authorized by a bill which went to the White House July 22 because it will differ sharply from any other government agency.

The foundation will have carte blanche to establish a national policy "for the promotion of basic research and education in the sciences." It will be administered by 24 scientists, engineers and professional men who will elect from their own number a chairman and vice chairman. They will appoint a director who will serve as the foundation's chief executive officer. The foundation has unusual freedom of action in making its own rules, authorizing expenditures and employing personnel "without regard to civil service regulations."

This seems to be an opportunity to create an organization that should be free of the inhibitions that plague many orthodox federal bureaus. The test of its success will be the reputation it has acquired about 10 years from now. —p. 71

* * * *

NEW DRIVE FOR STEEL: There are indications that the time is near at hand when extreme pressure is going to be exerted upon producers of steel to do something to relieve the continued shortage of certain steel products. Almost every day witnesses one or more incidents in which a plant suspends operation, the building of a new plant is postponed or some other kind of project is modified because of lack of steel.

Continued repetition of these experiences has exhausted patience in some quarters. This attitude is being reflected with increasing force in Washington, particularly in the Steel Subcommittee of the Senate Small Business Committee.

As a result, the heat will be put on the steel industry shortly in an effort to get something more tangible than statements that present capacity is adequate. While one can appreciate fully the predicament of the steel producers, one can hope that they are not as complacent over the situation as their statements sometimes seem to imply. —pp. 63, 65

SIGNS OF THE TIMES: Price factor is responsible for a curious quirk in the volume of new machine tool orders in June. On the basis of dollar value, new orders received during that month were the highest since last October (p. 66), but in terms of units they were the lowest in any month of the postwar period. . . . Anti-Friction Bearing Manufacturers Association, after surveying the agricultural implement situation (p. 67), concludes the small farm owners, whose farms account for 60 per cent of the nation's farm acreage, will buy $1 billion worth of farm equipment for at least several years. . . . According to a Navy Department report on scrap steel, many South Pacific beaches are piled high with rusting equipment which probably never will be salvaged for scrap because of the prohibitive cost of moving and processing it. At Subic Bay alone are 101,500 tons of scrap (p. 65) in a battered fleet of LST's. . . . Trend of Belgian steel production continues upward. Present monthly output of about 230,000 metric tons (p. 73) represents about 80 per cent of the average prewar output in the years 1936-1939. . . . Frank Rising, general manager of Automotive & Aviation Parts Manufacturers Inc., is guest editor for "Mirrors of Motordom" this week. He discusses the fascinating topic of the rising spiral of wages and prices. He reviews what has been going on in the way of pensions, shorter work weeks and other similar developments (p. 75), and then makes some pertinent remarks about the theory of high mass purchasing power. He concludes that the ultimate consumer pays for all of these niceties and predicts that some day he may find that the cost is prohibitive, in which case the dream world of high purchasing power will collapse. . . . In checking the price advances of 14 important steel products which accounted for 63.4 per cent of the shipments of finished steel during the first five months of 1947, the editors find that the increases range from 6 to 12 per cent (p. 59) and average 9.9 per cent. It is estimated that during the remaining five months of the year, the price increases on these 14 products will add about $102 million to customers' bills. . . . Numerous congressional investigations are scheduled for the next few months. Most important will be hearings starting Sept. 15, (p. 68) on developing a program to prevent a major postwar business depression.

E. L. Shaner

EDITOR-IN-CHIEF

The Department Store Idea

When you think of a Ryerson Plant, picture a huge department store featuring all kinds and shapes of steel. In place of the ordinary sales personnel, think of a large staff of experienced steel men—a sales department that's been carefully trained to guide your steel purchasing—to see that you get the exact steel you need for the job at hand.

And, when you think of Ryerson Steel-Service, think of a smooth-flowing system of steel supply that eliminates every unnecessary delay between order desk and point of delivery. Think of the most modern steel storing, cutting and shipping methods —methods based on more than a century of performance. And remember that Ryerson Steel-Service functions with the same efficiency and promptness whether your order calls for pounds or tons.

Naturally, today's great demand for steel frequently unbalances our stocks. But if the steel you need is not immediately available, we'll gladly do everything possible to supply you with a practical alternate.

What does it all add up to? Well, just about the last word in steel-buying convenience. And it's all yours when you contact a Ryerson Plant for any steel requirement.

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RYERSON STEEL

Use your *OLD* tie-rods in your *NEW* pickling tank

NEW WOOD PICKLING TANK built by **The Hauser-Stander Tank Company,** *Cincinnati, Ohio. Its Monel tie-rods have already seen 7 years of continuous service in the old pine tank pictured at the left.*

Salvage of Monel rods both economical and practical, says HAUSER-STANDER TANK COMPANY, Ohio manufacturer

One test of a tie-rod's merit is its ability to keep a pickling tank tight.

Another, its ability to outlast the tank itself.

On both tests, Monel* tie-rods, nuts and washers show up exceptionally well.

So outstanding is their resistance to corrosive pickling solutions, that **The Hauser-Stander Tank Company** of Cincinnati, Ohio, frequently suggests re-use of Monel tie-rods in new tanks!

Note the illustrations on this page. One tank is new; one is old. *But the tie-rods are the same.* Hauser-Stander took them from the old pine tank where they had seen seven years of continuous service, and used them to bind the new tank.

On occasion, Hauser-Stander has taken Monel rods which have served in *two* wooden tanks, and put them into a *third.* It's possible to do this because corrosion-resistant Monel combines high strength and high yield point with high ductility. Even under severe conditions, Monel retains these properties. That's why it is also possible to take old tie-rods and fabricate them into hooks, eyebars or pickle pins.

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Steel Increase To Fan Out To Durable Goods

Most manufacturers expected to pass on to consumers average 10 per cent boost in steel cost. Full impact of raise yet to be assessed

Scene in warehouse of Carnegie-Illinois sheet and tin mill showing galvanized and corrugated sheets being moved preparatory to shipment to consumers

IMPACT of the general advance in steel prices on the consumer durable and capital goods remains to be fully determined, but it is a foregone conclusion that, as a general thing, manufacturers will pass along the higher prices to consumers.

While it is too early for metalworking firms to fully assess the increase in their costs, few show any disposition to absorb the higher prices, many of them holding the view that the price line, if any existed, had been broken wide open by the coal wage settlement and the subsequent steel increases. "Why," they ask, "should we take the rap?"

The price increases to be announced by durable goods manufacturers will be more than the actual increase in their steel costs. For example, the average household refrigerator requires from 180 to 200 pounds of steel, meaning an increase in costs for steel of 65 to 70 cents. Steel for the average automobile will cost about $11 a unit more. Steel for the small farm tractor will cost $5-6 more. These figures will be of little help in estimating the probable increases in the price of the finished product. More likely, the percentage increase in steel prices, around 10 per cent of the base prices, will be a more accurate gage of the increases to come on end-products.

Independents Lead Rise

By the end of last week virtually every steel producing interest had advanced prices. The price line had been broken wide open on July 25 when the American Rolling Mill Co., Middletown, O., and the Republic Steel Corp., Cleveland, announced a general increase. Action by these producers was immediately followed by others though the two leading producers, United States Steel Corp. and Bethlehem Steel Co., delayed announcing policy until July 29.

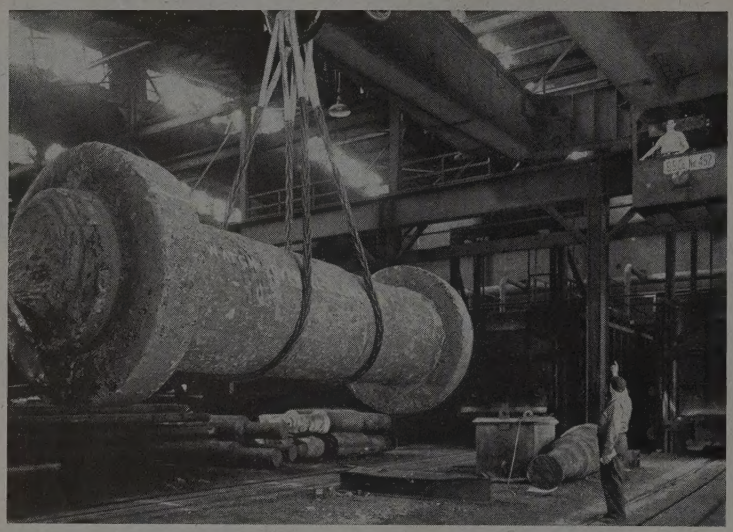
As a result of the increases effected, the nation's monthly steel bill over the remainder of this year will be around $32 million higher, which means that in the closing five months consumers will pay in excess of $160 million dollars more for their steel supplies than they did in the first seven months of the year. On an annual basis it is estimated the increase in steel costs will top $385 million.

These estimates are based on shipments of large consumption products in the first half of this year. They do not take into account any additional increase which may be effected in coming months and which has been hinted as likely by several companies in event the current boost does not cover production costs.

Added estimated cost to consumers over the remainder of 1947 on a selected list of large-consumption items is as follows:

Product	Increased cost over remainder of 1947
Structural shapes	$11,158,608
Plates	15,431,886
H-R carbon bars	15,992,550
H-R alloy bars	3,778,755
C-F carbon bars	4,704,547
C-F alloy bars	657,690
Wire rods	649 536
H-R sheets	17,956,014
C-R sheets	15,585,128
Galvanized sheets	5,290,080
Electric & enameling sheets	1,641,304
H-R strip	4,365,510
C-R strip	4,724,573
Total* (5 mo.)	$101,936,181

As a general thing the increase in steel prices averages around 10 per cent though the percentage of change varies with the individual products, on some items being up as much as 12 per cent, and on others only about 6 per cent. The



HEAVY LIFT: Two braided wire rope slings lift an 85-ton turbine shaft forging from the floor of a heat treatment shop of Bethlehem Steel Co., Bethlehem, Pa. Slings are made of 8 part 7/8-in. wire rope, 22 ft long, at Bethlehem's Williamsport plant

United States Steel Corp. estimated the increases it was effecting as of Aug. 1 would average out at about $5 per ton. Republic Steel estimated its advances ranged from $5 to $8 per ton, the average coming out at less than 9 per cent on published prices. On the whole, individual product advances range from $5 to $10 per ton.

Comparative prices on a number of selected products, showing also the percentage of shipment of each product to total shipments, the increase in base price and percentage increases are given in the following table:

Product	% of total Average Monthly shipments	Old Price ($ per cwt)	New Price ($ per cwt)	Increase ($ per ton)	Percentage increase
Shapes	7.2	2.50	2.80	6.00	12.0
Plates	9.9	2.65	2.95	6.00	11.3
H-R carbon bars	10.3	2.60	2.90	6.00	11.5
H-R alloy bars	2.9	3.05	3.30	5.00	8.2
C-F carbon bars	2.6	3.20	3.55	7.00	10.9
C-F alloy bars	0.4	3 80	4.10	6.00	7.9
Wire rods	1.0	2.675	2.85	3.50	6.5
H-R sheets	11.6	2.50	2.80	6.00	12.0
C-R sheets	8.6	3.20	3.55	7.00	10.9
Galvanized sheets	2.6	3.55	3.95	8.00	11.3
Enamel sheets	....	3.55	3.95	8.00	11.3
Electric sheets	0.9	5.00	5.30	6.00	6.0
H-R strip	2.8	2.50	2.80	6.00	12.0
C-R strip	2.6	3.20	3.55	7.00	10.9
Totals	63.4	...	...	...	Av. 9.9

All of the steel companies in raising their prices attributed their action to the mounting cost of production due to wage and raw material costs. Currently the zooming scrap market was pointed to as a cause for concern.

The average increase of about $5 a ton by the United States Steel Corp. subsidiaries does not meet the increase in costs since the first of the year, according to Irving S. Olds, chairman. Nor does it include any amount to cover increased costs which will result from the recent coal labor settlement, which will add at least $1.50 a ton to the cost of finished steel.

He explained the conservativeness in price action by stating the corporation would like to have a longer period in which to study costs, and note the effects of possible improved labor efficiency and other factors. Conservative action, he said, was being pursued in the national interest, although permitting a fair return to the investors.

Mr. Olds pointed out that in some products Steel corporation subsidiary prices were lower than those announced by some other sellers, but in no instance higher than any which had been announced by the independents. He looked for little or no buyer resistance to the higher prices now going into effect, and, in fact, anticipated a strong overall demand for steel over the remainder of the year. He emphasized that the increases would add little, directly, to the cost of manufacturing consumer durable products.

It was still too early, he said, to gage the effect of wage increases of 12 and 15 per cent granted in many industries last spring. It would probably require seven or eight months to provide the full impact. Incidentally, he pointed out that recent wage increases in the coal industry followed this time, rather than led advances in other industries.

The only real threat to active operations over the remainder of the year, he said, might be the scarcity of scrap. This is not only a threat to sustained high operations, but an unstable factor in the cost outlook. The price of scrap, he said, has advanced more than $10 a ton within the last two months. The Steel corporation subsidiaries consume about 2 million tons of purchased scrap a year, and at the rate of the recent increase would cost the corporation an extra $20 million.

Inland Steel Co., which advanced prices $5.75 per net ton on the average, or about 9 per cent, stated the current advances will compensate only partially for increased production costs. Present costs, based on current materials prices and prevailing wage rates, have increased more than $10 per ton since December, 1946, date of the last general steel price increase. Steelmaking costs have increased as follows: Steelworkers' wages, more than 20 cents an hour, up 15 per cent; scrap up 50 per cent; cost of coal, including recent coal wage settlement and higher transportation costs, up more than 20 per cent; iron ore, reflecting wage increases to miners, up more than 10 per cent; fuel oil, up more than 25 per cent; pig tin, up 35 to 40 per cent.

Buyer Resistance Feared

Price increases will be made reluctantly by the fabricating companies, whose executives are shaking their heads and wondering where the upward price spiral is going to end. Metalworking heads realize the imminent probability of pricing themselves out of the market.

International Harvester Co., Chicago, which in an effort to stem the inflationary tide reduced prices on many of its products in the face of advancing costs early this year, has not yet determined what effect the recent developments will have on prices of its products.

Having taken the lead in a campaign to hold or reduce prices, the company is reluctant to make any advances, but its officials admit it may be unable to resist the rising tide.

The same factors that have increased steelmaking costs also have affected the metalworking companies, T. J. Flanagan, president, Garden City Fan Co., Chicago, points out in explaining that he sees no alternative to passing along the higher

costs. Practically all materials costs, transportation charges, overhead and labor costs have been moving upward.

A manufacturer of machine shop specialties takes a similar view. The steel price increase is just another step in upping costs, which the company says it no longer can absorb.

Some companies sell certain types of equipment on contracts containing escalator clauses to adjust selling prices to current costs. For example, Link-Belt Co., Chicago, engineer and manufacturer of conveying, elevating, materials handling, equipment and power transmission machinery, has certain engineering contracts for tailor-made installations in which the price is determined by a cost index which includes, among other things, STEEL's composite price of finished steel. Such contracts will quickly reflect the steel price increase. On other lines of equipment, Link-Belt will study the effect on their costs before adjusting prices.

In certain metal products, the cost of steel used is relatively insignificant. In the more complex coin-operated machines, for example, the amount of metal used is minor in relation to the amount of designing and engineering skill required, and some makers of such equipment may absorb the increase.

Generally, the end-products which take a relatively large amount of steel in relation to the labor and engineering required to produce it will be the first to reflect the steel price increase.

An interesting development in connection with durable goods pricing policy was the announcement last week by SKF Industries, Inc., Philadelphia, that it has adopted a new policy aimed at establishment of a firmer price basis in accepting orders for anti-friction bearing products. Under the new policy where price increases are necessary they will apply only upon balances which remain unshipped 90 days after formal notification of such advances. Heretofore, orders were accepted on the basis of invoice prices prevailing at the time of shipment. The new policy applies also to unfilled orders now on the company's books. Comparing the company's price structure with that of 1941, SKF reports that increases for all anti-friction products average about 15 per cent.

Congressional Economy Cuts Statistics on Business

Due to curtailed appropriations in the last congressional session, Bureau of Census has put into effect a very much restricted schedule of statistical reports, under which coverage will be reduced on steel castings, cast iron products, steel forgings, nonferrous castings and construction machinery.

The bureau has eliminated entirely its former monthly reports on steel boilers, home and farm freezers, porcelain enameled products, and the domestic portion of its sewing machine report. There will be curtailed details as to production in various other commodities.

Weirton Lets $4 Million Contract for Oxygen Plant

Weirton Steel Co., Weirton, W. Va., has awarded a $4 million contract to Air Products Inc., Emmaus, Pa., for construction of an oxygen-producing plant. The facility, which is expected to be completed in 18 months, will be capable of producing 300 tons of oxygen a day. A boost of 25 per cent in output is anticipated from use of the oxygen.

Pig Iron Output in June Down 5 Per Cent from May

Production of pig iron in June was 4,759,912 tons and of ferromanganese and spiegeleisen, 49,897 tons, bringing total blast furnace output for the month to 4,809,809 tons, American Iron & Steel Institute reports. June's figures were 5 per cent below both the May pig iron output of 5,029,496 tons and the total production for that month of 5,081,131 tons.

The latest month's figures place operation at 89.0 per cent of capacity, compared with an average operating rate of 90.4 per cent for the first half of the year. Total output during the six-month period was 29,480,328 net tons.

Safety Record in Mineral Industries Recedes in 1946

The safety record of the mineral industries receded in 1946 and the overall frequency of injuries increased from 52.58 per million man-hours of work in 1945 to 55.43 in 1946, according to a mineral industry survey prepared by the Bureau of Mines, U. S. Department of the Interior.

Fatalities were less in 1946, with 1161 deaths, or a rate of 0.85 per million man-hours. A principal factor in the retrogression of mine safety during 1946, reports the survey, was incomplete training in safe job methods.

Present, Past and Pending

ALGOMA STEEL CORP. GETS BESSEMER CAPACITY
TORONTO, ONT.—Algoma Steel Corp. has installed new bessemer converter capacity, first such in use in Canada. Algoma, producer of steel for 25 years by the basic open-hearth method, will now have a yearly steel capacity of a million tons.

INDIAN MOTOCYCLE STOCKHOLDERS VOTE MERGER
SPRINGFIELD, MASS.—Indian Motocycle Co. stockholders voted last week to merge the company with R. B. Rogers Companies Inc., manufacturer of air conditioning equipment and other products. Indian Motocycle will be the surviving company and will continue to make motorcycles primarily, said Ralph B. Rogers, president.

MANUFACTURERS' SHIPMENTS DECLINE
WASHINGTON—Manufacturers' shipments in June were about $13.6 billion below May, the U. S. Commerce Department reported. Their inventories, rising $300 million, reached $22.7 billion in June, the gain accounted for entirely by the durable goods industries.

REMINGTON RAND PLANT'S NINE-WEEK STRIKE ENDS
ELMIRA, N. Y.—Nine-week strike of 6500 members of the International Association of Machinists at the Remington Rand Inc. plant here was settled last week for an eight-cent-an-hour wage increase and six paid holidays a year.

BRASS PRODUCTS PLANT REDUCES WORK WEEK
THOMASTON, CONN.—Plume & Atwood Mfg. Co.'s plant here has reduced its work week from 40 hours to a four-day, 32-hour week. The company, manufacturer of brass products, said the reduction was dictated by "a temporary recession of business."

RESTRICTIONS PLACED ON EXPORT LICENSES
WASHINGTON—Export licenses may now be used to export only the commodities named therein pursuant to firm orders the licensee has received on or before validation date of license, the Office of International Trade announced.

Reconversion in 1946 Changes Distribution Pattern of Steel

Steel consuming industries, such as ordnance and shipbuilding, which had been large-scale users during war relegated to minor ranks. Automotive industry becomes leading industrial outlet. Total of 48,775,532 net tons shipped

CHANGES in the steel distribution pattern, reflecting the shift from war production to peacetime applications, were numerous in 1946. Many consuming classifications which in 1945 ranked high in consumption of steel slipped in 1946 to among the lowest users, according to figures compiled by the American Iron & Steel Institute.

Total steel distributed to consuming industries in 1946 was 48,775,532 net tons. In 1945, 57,242,240 tons of steel were shipped to all industries. Strikes in the steel and coal mining industries caused the major part of the 8,466,708-ton decline in 1946 as compared with production during the last war year.

As in 1945, jobbers, dealers and distributors in 1946 took the largest share of steel produced—9,304,817 tons in 1946 and 9,571,436 tons in 1945. The automotive industry, which in 1945 ranked eleventh with 2,162,964 tons, was second in 1946 with 6,112,120 tons. The steel converting and processing industry dropped from third to fifth place, taking 5,504,000 tons in 1945 and 4,239,471 tons in 1946.

In third place in 1946 was the construction (including maintenance) industry with 4,767,703 tons. This classification in 1945 was in fifth place with 4,663,774 tons. Also moving up two steps in rank over 1945 was the container industry, which in 1946 took 4,255,287 tons. In 1945, this industry, then in sixth place, took 4,332,692 tons. Rail transportation, in sixth place in 1946, took 3,806,746 tons. In 1945 this classification was the fourth ranking consumer, using 5,121,197 tons.

Steel products unclassified as to industries using them was in seventh place in 1946, with 3,549,461 tons. Between 1945 and 1946, the institute revised its method of reporting these figures somewhat so that no comparable figure is available for this classification.

In eighth place in 1946 was exports with 3,026,771 tons. These in 1945 accounted for 3,793,343 tons. Machinery, industrial equipment and tools was in ninth place in 1946, accounting for 2,415,517 tons. In the 1945 classification, machinery and tools and electrical machinery and equipment were lumped together and took 2,425,657 tons.

Contractors' products, using 1,618,739 tons in 1946, was in tenth place. This grouping, which was not included in the 1945 data, includes air conditioning and ventilating equipment, builders' hardware, culverts and concrete pipe, plumbing and heating equipment, etc. In 1945, a pressing, forming and stamping industry classification was included, this taking 3,719,330 tons and ranking eighth.

Eleventh place in 1946 went to the "other domestic and commercial equipment" group, which includes such manufactures as toys, motorcycles, domestic and office furniture, professional and scientific equipment, license plates, etc. This group consumed 1,398,055 tons of steel products last year. Appliances, utensils and cutlery in 1946 took 1,227,154 tons of steel. Thirteenth place user—the electrical machinery and equipment industry—accounted for 1,154,506 tons. In fourteenth place with 1,030,335 tons was the agricultural industry. In 1945 agriculture ranked thirteenth with 1,120,320 tons.

Oil and gas drilling took 316,366 tons in 1946 to place it fifteenth. In the previous year's compilation, this classification was combined with mining, lumbering and quarrying and was in twelfth place with 1,605,707 tons. Shipbuilding was sixteenth with 283,803 tons; in 1945 this classification was in ninth place with 2,719,415 tons; and in 1945 it led the steel-consuming industries, using over 10 million tons.

Seventeenth place went to mining,

Distribution of Leading Steel Products

(In net tons of the 23 leading steel products in

Market Classification	Semifinished Steel	Shapes	Plates	Rails (Over 60 lbs.)	Tie Plates	Hot Rolled Bars	Cold Finished Bars	Concrete Reinforcing Bars	Butt Weld Pipe	Electric Weld Pipe	Seamless Tubing	Mech., Pressure Tubing
Converting and Processing	3,806,469	40,715	350,251	15,940	19,873	2,086,210	128,871	16,850	77,891	7,549	131,672	4,818
Jobbers, Dealers, Distributors	29,096	786,651	709,728	5,706	1,857	1,026,873	503,109	409,456	911,522	243,059	1,013,988	133,187
Construction, Maintenance	16,847	1,533,633	919,849	10,524	549	284,216	3,740	531,095	45,483	278,288	339,143	9,418
Contractors' Products	15,205	10,210	82,319	.....	.....	123,449	9,105	27,533	42,460	4,543	52,671	7,929
Automotive, excl. Tractors	173,491	31,325	239,084	.....	.....	1,238,463	222,395	.....	4,544	3,713	20,684	53,161
Rail Transportation	69,994	358,163	584,272	1,176,648	340,907	355,345	6,652	466	8,943	339	8,992	17,270
Shipbuilding	1,197	47,449	179,758	20	.....	19,350	2,135	.....	1,783	187	2,636	339
Aircraft	2,708	.....	2,180	.....	.....	2,874	5,918	.....	.....	7	2,324	1,332
Oil, Gas Drilling	19,919	19,082	53,856	.....	.....	67,519	12,769	.....	8,362	49,849	63,358	2,360
Mining, Quarrying, Lumbering	1,222	12,586	34,637	3,193	270	52,125	2,246	325	3,381	7,330	7,821	225
Agricultural	35,211	36,962	65,039	.....	.....	398,696	60,641	1,230	9,204	406	2,986	18,065
Machinery, Industrial Equipment, Tools	132,006	174,446	513,027	1,890	.....	599,442	250,490	.....	10,289	6,512	120,871	45,561
Elect. Mach., Equipment	31,245	22,833	80,393	.....	.....	94,717	42,563	.....	88,763	1,181	3,823	2,676
Appliances, Utensils, Cutlery	.....	1,174	9,400	.....	.....	15,192	35,303	.....	8,407	396	5,402	5,049
Other Domestic, Commercial Equipment	7,925	13,063	76,234	.....	.....	71,850	49,915	.....	5,853	11,366	3,163	26,881
Containers	22,496	413	142,886	.....	.....	23,258	43	.....	.....	.....	2,397	817
Ordnance, Other Military	6,864	822	1,360	.....	.....	6,353	1,570	275	195	540	298	497
Unclassified	291,910	170,314	15,526	376,309	83,394	521,659	159,015	78,397	6,938	.....	22,598	82,754
Export	386,036	219,842	343,091	204,971	19,346	255,932	20,489	132,850	87,664	59,785	150,154	20,319
Total	5,049,841	3,479,683	4,402,890	1,795,201	466,196	7,243,523	1,516,969	1,198,477	1,321,682	675,050	1,954,981	432,658
*Less shipment to members of industry for conversion	2,186,920	5,399	250,709	4,890	18,700	846,386	4,153	8,648	45,393	591	83,441	3,478
Net Total	2,862,921	3,474,284	4,152,181	1,790,311	447,496	6,397,137	1,512,816	1,189,829	1,276,289	674,459	1,871,540	429,180

* All of these shipments were made to the group classified as "Converting and Processing."

arrying and lumbering with 209,758 ns. Ordnance and other military with nly 30,458 tons was in eighteenth ace, having fallen from position as sec- nd largest consumer in 1945 with 508,761 tons. At the bottom of the st was the aircraft industry, which in 945 was fourteenth with 301,194 tons; st year this industry consumed 28,- 35 tons.

In addition to the leading products own in the accompanying table, the llowing products are included in the tal steel consumption data: Electrical eets and strip, 305,733 tons; lap weld pe, 305,516 tons; wheels, 252,308 ns; barbed and twisted wire, 207,610 ns; steel piling, 205,313 tons; joint rs, 176,803 tons; track spikes, 146,- 4 tons; rails (under 60 lb), 144,999 ns; axles, 130,461 tons; enameling eets, 129,437 tons; chemically treated ack plate, 125,170 tons; bale ties, ,993 tons; conduit pipe, 98,521 tons; d tool steel bars, 96,020 tons.

Cincinnati Shaper Buys Leased Plant from WAA

A government-owned plant in Cincin- ti, operated during and after the war Cincinnati Shaper Co. to produce avy-duty shears and presses, has been quired by that company for $608,000, cording to War Assets Administration. nce last August the plant has been erated under an interim consent agree- ent, so that following adjustment for ntals already paid on it by the com- ny the facility will cost $582,594.

Consumer Pressure for Enlarged Steel Capacity Seen Increasing

Facing continued scarcity in supply of such products as strip, sheets and pipe, indications are users' campaign for expansion of existing facilities will be stepped up. Life of Senate steel investigating committee extended

WITH prospects dim for any substantial early easing in demand for those finished steel products which have been in tight supply ever since the end of the war, chiefly strip, sheets and pipe, expectations now are the steel industry will be subjected to increasing pressure from consumers and government agencies to enlarge existing facilities.

Now that Congress has adjourned, the growing concern over the problem of steel supply promises to be a hot subject during the next few weeks. Sen. Edward Martin (Rep., Pa.), head of the Senate Small Business Committee's Steel subcommittee, plans to call top steel industry executives to an open meeting about Aug. 15 at which he will tell them that one witness after another has complained about steel shortages and their hampering effect on the economy.

Senator Martin, it is said, plans to tell the steel men that they are showing too little concern over the problem of steel shortage and will ask them what they propose to do about the matter. The Steel subcommittee, which has been taking testimony on the subject of steel shortage and the "gray" market for months past, was given a new lease on life when Congress voted to continue the Small Business Committee.

Several other developments point to increased pressure for relief from the steelmakers. For example, last week Henry Kaiser told the Brewster committee that the shortage of steel is a very serious thing and has been forcing the closing down of plants and curtailing many operations, and that, consequently, it is a threat to the economy.

Last Thursday the subcommittee of the Senate on interstate and foreign commerce met with leading steel executives and discussed the prospects of providing more steel to relieve the box car shortage. Car production is said to be falling short of expectations and to date this year more cars have been removed from service than have been built to replace them. Overall car steel supply is said to be sufficient for building 10,000 units monthly but difficulties are encountered in completing construction of many units because of shortages of

(*Please turn to page* 158)

by Consuming Industries---Year 1946

grades of steel, including alloy and stainless)

Drawn Wire	Nails, Staples	Woven Wire Fence	Ordinary Black Plate	Hot Dip Tin, Terne Plate	Electrolytic Tin, Terne Plate	Hot Rolled Sheets	Cold Rolled Sheets	Coated Sheets	Hot Rolled Strip	Cold Rolled Strip	Total (All Products)	Market Classification
763,392	3,842	191	33,134	286	138	583,647	30,264	9,977	300,881	91,904	8,537,360	Converting and Processing
151,375	474,786	286,915	96,133	46,959	15,629	810,196	453,491	440,457	107,905	45,088	9,304,817	Jobbers, Dealers, Distributors
19,972	7,787	1,140	1,505	1,463	117	270,025	46 839	160,526	71,221	13 877	4,767,703	Construction, Maintenance
22,720	4,875	.....	28,071	2,146	24	515,671	263,922	273,213	67,124	49,744	1,618,739	Contractor's Products
68,977	1,138	.....	10,302	3,507	4,326	1,445,032	1,765,322	81.996	412,107	226.424	6,112,120	Automotive, excl. Tractors
4,167	5,928	1,987	164	290	167	215.569	14,224	36.295	34,051	5,979	3,806 746	Rail Transportation
1,333	459	.....	29	78	.....	12,051	4,115	7,522	1,088	140	283.803	Shipbuilding
293	30	.....	.....	12	.....	2,956	1,764	1,229	2,648	1,752	28,465	Aircraft
179	153	.....	.....	36	.....	10,995	179	371	336	194	316,366	Oil, Gas Drilling
1,612	1,190	141	.....	56	.....	14,584	2.709	742	2,465	160	209.758	Mining, Quarrying, Lumbering
25,998	1,753	304	986	2,071	2,110	131,189	38,014	105,512	87,014	6,411	1,030,335	Agricultural Machinery, Industrial Equipment, Tools
72,494	3,145	72	2,355	5,208	596	231,340	53,225	14,659	97,081	54,247	2,415,517	Elect. Mach., Equipment
31,887	659	.....	1,345	382	330	220,242	85,653	30,272	61,096	46,481	1,154,506	Appliances, Utensils, Cutlery
33,849	235	.....	83,947	9,492	3,441	208,921	501,677	76.300	36,800	77,192	1,227,154	Other Domestic, Commercial Equipment
22.529	2.411	.....	44,708	7.254	4,876	244.289	341.845	49.751	75.995	127.296	1.398.055	Containers
77,199	13,771	.....	416,129	1,489,841	849,859	591,883	240,696	37,540	135,232	89,162	4,255,287	Ordnance, Other Military
654	331	.....	27	1,567	205	2.986	2.383	268	1.392	1.397	30.458	Unclassified
106.947	96,885	87,373	.....	.....	.....	232.970†	115.167	71.991	49 564	458.129	3.549.461	Export
63,139	18,051	5,107	65,511	354,009	27,355	198,115	117,462	65,157	56,988	12,473	3,026,771	Total
768,716	637,429	383,230	784,346	1,924,657	909,173	5,942,661	4,078,951	1,463,778	1,600,988	1,308,050	53,073,421	
35,592	797	.....	3,179	.....	.....	421,198	3,397	1,725	237,176	25,904	4,297,889	* Less shipment to members of industry for conversion
733,124	636,632	383,230	781,167	1,924,657	909,173	5,521,463	4,075,554	1,462,053	1,363,812	1,282,146	48,775,532	Net Total

Includes enameling sheets and electrical sheets and strip.

Rising Costs Cut Steel Earnings

RISING operating costs without an accompanying increase in selling prices cut the steel industry's net profit in the second quarter of this year approximately 24 per cent below that of the first quarter.

The decline occurred in the face of a higher average rate of steel ingot production in the second quarter, average for the period being approximately 96 per cent of capacity, compared with 93 in the first quarter of the year.

The accompanying compilation shows that 18 ingot producers representing 83 per cent of the nation's ingot capacity had aggregate net profit of $82,101,601 in the second quarter of 1947, 24 per cent below those companies' aggregate of $108,374,065 in the first three months of the year. Of the 18 companies only five reported their second quarter net profits were above those for the first quarter of this year.

In some instances net profits for the 1947 second quarter were substantially above those for the corresponding period of 1946 when steel production had not gotten into full swing after first-quarter steel strike. In addition, second-quarter earnings in 1946 were adversely affected by a coal miners' strike which disrupted the steel industry's fuel supply.

Because of the more favorable operating conditions in the first half of 1947 than in the corresponding period of 1946 the aggregate net profit of the 18 steel ingot producers in the first half of 1947 was $190,475,666, nearly 2½ times the $78,276,190 for the first six months of last year. For the first half of 1946, five of the companies reported net losses, but for the first half of 1947 all of them showed net profits.

Second-quarter net profit of steel industry is 24 per cent under first quarter. Rising costs make improvement during rest of '47 problematical despite steel price boost

The decline in second-quarter net profits was not surprising (STEEL, May 12, p. 78) because at the beginning of that period it was apparent the earning abilities of the steel companies would be throttled by the steelmakers' wage increase that became effective Apr. 1. Meanwhile, raw material costs and rehabilitation costs were on the upgrade.

While steel producers have recently announced price increases it is problematical how much the earnings position of the industry will be strengthened, for the recent miners' wage increase has boosted steel companies' fuel costs, oth raw materials costs (notably scrap) co tinue on the upgrade, and plant rehabi tation costs are up considerably.

The lower second quarter net prof in various instances reflected substant charges for depreciation. With one lar producer this additional charge for d preciation was equivalent to 30 per ce of the depreciation charges as ordinar computed in the past. That produc pointed out that this additional amou is materially less than the percentage increase in cost of new plant constru tion over prewar cost but is deem appropriate at the moment pending fu ther study. That producer further poi ed out that if the charge for wear a exhaustion of facilities installed in earli years is continued on the old basis their original cost, the resultant reser will be inadequate to cover the cost the replacements which will be nec sary when these earlier facilities ha served their useful life.

U.S. Steel's Order Backlog Equals 5 Months Output

Unfilled steel order bookings of t United States Steel Corp. have sho little change so far this year, amounti to about five months production. Th

Comparison of Steel Industry's Second Quarter Net Earnings

	Second Qtr. 1947	First Qtr. 1947	Second Qtr. 1946	First Half 1947	First Half 1946
United States Steel Corp.	$29,336,868	$39,234,511	$13,900,270	$68,571,379	$24,138,54
Bethlehem Steel Corp.	12,408,966	16,090,426	14,447,207	28,499,392	19,251,64
Republic Steel Corp.	5,214,820	11,516,795	4,802,756	16,731,615	4,455,34
Jones & Laughlin Steel Corp.	5,366,124	6,337,132	2,343,298	11,703,256	3,156,54
Youngstown Sheet & Tube Co.	4,293,389	7,335,749	3,099,099	11,629,138	4,304.54
National Steel Corp.	5,775,757	7,325,058	5,602,988	13,100,815	7,686,34
Inland Steel Co.	4,975,431	5,195,857	3,926,342	10,171,288	4,973,30
American Rolling Mill Co.	6,312,104	5,918,876	5,218,129	12,230,980	7,022.61
Wheeling Steel Corp.	2,841,804	2,948,268	1,080,266	5,790,072	1,102,92
Crucible Steel Co. of America	376,214	891,810	1,695,034	1,268,024	47,71
Lukens Steel Co.	465,843	457,803	171,297	923,646	673,26
Granite City Steel Co.	316,591	398,295	522,481*	714,886	981,58
Alan Wood Steel Co.	502,432	491,593	130,047	994,025	133,37
Allegheny Ludlum Steel Corp.	1,688,031	1,829,609	2,194.085	3,517,640	2,446,12
Continental Steel Corp.	248,231	393,223	380,153	641,454	391,11
Keystone Steel & Wire Co.	1,403,605	1,342,815	758,581	2,746,420	1,287,48
A. M. Byers Co.	438,480	410,934	154,927	849,414	154.93
Copperweld Steel Co.	136,911	255,311	239,061	392,222	50,54
Totals	$82,101,601	$108,374,065	$59,621,059	$190,475,666	$78,276,1
Empire Steel Corp.	399,991	245,124		645,115	
Portsmouth Steel Corp.	1,024,359	1,009,320		2,033,679	
FINISHING CAPACITY ONLY					
Acme Steel Co.	$2,081,732	$2,055,118	$1,029,665	$4,136,850	$1,708,99
Superior Steel Corp.	383,608	275,743	473,300	659,351	436,62
PIG IRON CAPACITY ONLY					
Interlake Iron Corp.	$1,235,106	$965,031	$234,666	$2,200,137	$481,27
Sloss-Sheffield Steel & Iron Co.	433,298	439,100	23,002*	872,398	27,83
Woodward Iron Co.	935,791	959,208	94,957	1,894,999	476,80

*Net loss.

flects in part the corporation's policy restricting future commitments. Exorts are running unchanged at about per cent of shipments and 5 per cent bookings. Here again restrictions on ders, and in important measure self-nposed, provide the principal answer. rewar export shipments of the corporaon often ran around 8 to 10 per cent total steel orders.

Asked concerning a report that the rporation's Federal shipyards were go-g to close down indefinitely, Irving S. lds, chairman, said there had been no ich official decision. He said the yards ow were closed down by strike, but hat they had actually little ship work on and at best.

Commenting on the increased cost of eel plant expansion, he said that the approximately $350 million which the cororation had authorized, as of the end of he first half, for additions and improvehents included $60 million which it had ot originally estimated would be required for the program.

He cited some scattered instances to emonstrate how prices have risen. A oke oven battery, with a capacity of 90,000 to 400,000 tons would have ost in 1939 approximately $20,800 per ven; in 1943; $37,100; today, $71,400. slab reheating furnace for a continuus mill in 1939 would have cost $121,-00; today the price would be double hat amount. The price of a wire-drawg unit has increased 100 per cent since 939.

Monarch Announces First Half Earnings of $354,678

Net earnings of Monarch Machine ool Co., Sidney, O., for the second quarer totaled $160,357, Jerome A. Raterman, president, recently disclosed. Net arnings for second quarter, 1946, were 159,353. Net earnings for the first alf of 1947 totaled $354,678 on net ales of $4,464,292, as compared to net arnings of $283,750 on net sales of $3,-07,297 for the first half of 1946.

Net sales in the recent quarter were 2,146,247, compared to $1,678,902 for he second quarter of last year.

Los Angeles Building Totals $34 Million in Half Year

During the first six months of 1947, 10 new factories were established in Los Angeles county with a total investnent of $34,259,000, Los Angeles Chamer of Commerce reports.

In addition 196 existing plants were xpanded, calling for an additional inestment of $26,966,000. Total investnent for the first half of the year in he 306 new and expanded units was 61,225,000.

Dodge West Coast Plant Project Delayed Due to Steel Shortage

President of Chrysler Corp. says construction of proposed assembly unit will be put off until other plants of company reach capacity operations. Had planned to start building work Aug. 1 at San Leandro site

SAN FRANCISCO

SHORTAGE of steel sheets will delay plans of Chrysler Corp. to build a new Dodge assembly plant in the San Francisco area, according to K. T. Keller, Chrysler Corp. president, who visited San Francisco recently.

Although Chrysler earlier had announced it would begin construction of the plant at San Leandro about Aug. 1, Mr. Keller said construction would be delayed until other production units of the company reach capacity operations. The shortage of sheet steel is holding Chrysler production to about two-thirds of capacity at present, he said, and he does not expect enough steel for capacity production will be available for many months.

Eventually, however, Chrysler expects to carry through with its San Leandro plant construction. When completed and operating at full capacity it will produce 400 Dodge autos and trucks daily—in a ratio of 250 autos and 150 trucks. The plant will employ about 3500 persons.

The new Chrysler plant thus would become the third largest of three auto assembly plants in this area. Ford operates an assembly plant at Richmond and Chevrolet has a plant in East Oakland.

Installs 16-ton Boltmaker

Bethlehem Pacific Coast Steel Corp. has just put into operation a 16-ton boltmaker capable of converting coils of 9/16-inch steel rods into ½ inch by 5-inch machine bolts at the rate of 70 per minute. The machine which has been installed at the company's South San Francisco mill is the first of its kind on the West Coast.

The boltmaker upsets the metal, trims the head, points the bolt and forms the thread as one integrated operation. The company plans to install a 3/8-inch boltmaker in the South San Francisco plant in the near future.

To Supply Pipeline Steel

Geneva Steel Co. has contracted to supply steel for fabricating a 37-mile natural gas pipeline from Salt Lake City to Provo, Utah. Pipe will be 10¾-in. diameter. Estimated cost will be $850,-000.

Construction of the pipeline is in compliance with a recent order of the Utah public service commission that Mountain Fuel Supply Co. provide a steady supply of natural gas to Provo and Utah County residents. That area has been receiving artificial gas from the Ironton plant of Geneva Steel Co. However, because uncertain supply caused several interruptions in gas service during the last year, the commission ordered the new line.

Construction of the new line is to begin in November and it is expected to be completed early in 1948.

Pacific Scrap Rusting Away

According to a Navy Department's scrap steel report many South Pacific beaches are piled high with rusting equipment which will continue to rust because of the expense of moving it.

It was officially estimated that scrap in the Philippines would cost nearly $20 a ton to process and ship to any West Coast port. This includes a $5 export tax levied by the Philippines government.

At current prices, a Los Angeles dealer said, not more than a "dollar or two" profit could be realized from such a transaction.

In Manila Bay are some 84 ships, both Japanese and American, partially submerged. Elsewhere are scattered small mountains of onetime equipment used on land. On Manus Island are 5000 tons of rusting wire rope once intended as submarine barriers. Along the island's beaches are planes, pontoons and landing barges.

At Subic Bay there are 101,500 "redeemable" tons of scrap in a battered fleet of LST's. Nine landing ships lie smashed against Subic rocks. Other islands offer similar harvests were it not for the high price of recovery, the report states.

Permanente Enters New Field

Permanente Metals Corp., Oakland, Calif., has gone into the aluminum building materials field with a new aluminum roofing and siding material for farm, residential and industrial construction. The company also has added a pig and ingot division to serve fabricators who operate their own foundries for production of permanent mold, die and sand castings.

Dollar Volume of New Tool Orders Rises Sharply

Number of units sold in June falls to postwar low, but value climbs to highest point since last October

ALTHOUGH higher prices on some lines of machine tools unquestionably drove some small buyers out of the market, dollar volume of new ordering in June increased to the highest point since last October and was 13 per cent greater than in May. Unit volume, however, slipped during the month and was lower than for any previous month in the postwar period.

On the basis of figures compiled by the National Machine Tool Builders' Association, it appears the current overall high level of production and efforts of manufacturers to reduce costs will continue to act as a stimulant to sales, at least to those companies which determine that lower unit cost of manufacture resulting from use of modern metalworking machinery will more than offset purchase price of new production equipment.

Estimated shipments by the entire industry, although in excess of new ordering, were 4 per cent below the May figure, and totaled $24,720,000—the lowest amount since July, 1946. Some difficulty is still experienced in obtaining components for tools, the most prevalent shortages occurring in electrical equipment, notably fractional horsepower motors. For the most part, however, shortages which hampered production early this year have eased.

Headway Made Against Backlogs

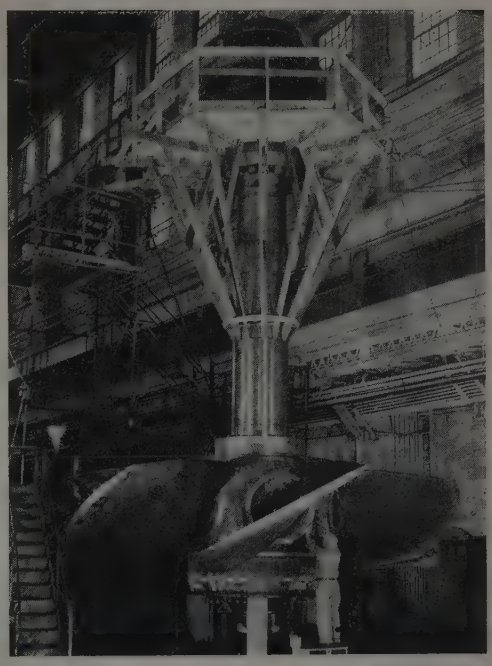
Despite the decline in shipments in June and the higher level of new ordering, order backlogs were again reduced. Dollar volume of cancellations, although above the average of the previous 12-month period, was less than half as large as in the previous month when announcements of impending price advances were made.

Foreign ordering, which in recent months has shown a smaller percentage of total sales, hit the lowest level percentagewise since October, 1945, latest figures placing foreign volume at less than one-fifth of the total. Shipments to foreign account, however, were well maintained at approximately one-quarter of the total.

Greater activity in the export market is seen following the 1947 Machine Tool Show at the Dodge-Chicago plant, which will have representatives of at least 28 foreign countries in attendance. A special program on Sept. 23 at the Overseas Dinner to honor these visitors has been arranged by NMTBA, the show's sponsor. To be held in the Palmer House, the dinner's program will feature a talk entitled "The Tools of Reconstruction" by Dr. Brooks Emeny. Dr. Emeny is president of the Foreign Policy Association and consultant to the State Department, and is an authority on world conditions, having served as a lecturer on international relations at Yale University, as delegate to the Tokyo Conference, Institute of Pacific Relations, and in other important posts which brought him in direct contact with world affairs. Toastmaster will be Charles J. Stilwell, president, Warner & Swasey Co.

Chairman of the dinner committee is Donald M. Pattison, vice president, Warner & Swasey Co. Serving with him in planning the program are: Nelson F. Caldwell, export manager, Cincinnati Milling Machine Co.; James C. Hebert, general sales manager, Jones & Lamson Co.; Ray F. Ingram, vice president, Landis Tool Co.; Alexander S. Keller, vice president and sales manager, foreign department, Pratt & Whitney; and Cecil M. Peter, general sales manager, Fellows Gear Shaper Co.

In connection with the show and sponsored by eight participating technical societies will be the Machine Tool Congress. The congress, lasting from Sept. 17 to Sept. 26, will consist of seven evening sessions in Chicago hotels, to be addressed by authorities in the metalworking industries. Details of the Machine Tool Congress program were given on page 45 of the July 28 issue of STEEL.



RUNNER: Huge adjustable blade Kaplan runner and shaft assembly for the fifth unit of TVA's Kentucky Dam recently was completed by Allis-Chalmers Mfg. Co. Runner is nearly 22 ft in diameter with its main shaft extending upward nearly 26 ft above the runner. Turbine rating is 44,000 hp under operating head of 48 ft

WAA Offers Surplus Tools, Heat-Treating Equipment

With War Assets Administration intensifying its sales drive this summer several offerings of surplus machine and hand tools and heat-treating equipment have been announced. In the Chicago region, Bruce J. Brown, director, announced opening of a month-long sale July 31 of 70 machine tools which cost the government about $370,000. The machinery, located at Warehouse 6, Hammond, Ind., is offered at fixed prices and included machines for boring, drilling, grinding, honing, milling, polishing, spot facing, gearing, spinning, tapping and threading.

A national competitive bid sale of surplus new hand tools and miscellaneous items is being conducted at Lordstown Ordnance Depot, Warren, O.

Inventories of nearly $43 million worth of surplus heat-treating furnaces and ovens are being offered at fixed prices ranging from 36 to 75 per cent of acquisition cost. The equipment, held by 15 regional offices, includes foundation and portable type heat-treating furnaces and ovens for enameling, japanning and lacquering. When new, its costs ranged from $500 to $250,000. In line with WAA's improved disposal program, companies may state their requirements for this type of equipment, and the agency will screen its inventories to satisfy these needs.

NLRB Nominees Unconfirmed as Senate Adjourns

Senate fails to act on appointments of Abe Murdock, J. Copeland Gray and Robert N. Denham

THE 80TH Congress closed its first session last week in the heat of a Senate political battle over President Truman's nominations that left several of the major ones unconfirmed, including three for the enlarged National Labor Relations Board.

The Senate failed to confirm nomination of Abe Murdock, former Democratic senator from Utah, and J. Copeland Gray of New York, former member of the War Stabilization Board, as members of the labor board. The upper house likewise did not act on the appointment of Robert N. Denham of Washington to the new post of general counsel for the board.

In this situation President Truman can give appointments enabling the men to serve during the Congressional adjournment and can submit their names again for confirmation next session.

Seek "Lewis" Clause at Ford

The United Automobile Workers pushed its campaign against the Taft-Hartley law last week with a demand on Ford Motor Co. for a contract that would absolve 108,000 production workers from penalties for wildcat strikes.

Richard T. Leonard, UAW vice president and director of the Ford department, said the company had taken no action on the demand for a so-called "John L. Lewis" clause that would bypass the new labor law by sending contract-violation cases through only normal grievance procedure.

The announcement came during a national meeting of Ford leaders called by Mr. Leonard in the midst of rumors that left-wingers in the union were out to smash the pension plan for Ford workers announced a month ago.

Ford Output Threatened

A strike of 7500 UAW-CIO workers at Murray Corp. of America threatens steadily widening shutdowns at Ford Motor Co. where Lincoln and Mercury operations have been suspended indefinitely. Ford buys 70 per cent of Murray's auto parts production.

The Murray walkout bears possibilities of being a CIO battle opener in a fight against clauses of the Taft-Hartley law making unions responsible for wildcat strikes. UAW struck Murray because the company refused to insert a clause in a pending contract which would exempt the union from such responsibility.

THOMAS E. SHROYER

Appointment as general counsel of the joint congressional committee which is to watch enforcement of the new Taft-Hartley labor law has gone to Mr. Shroyer, former Wagner Act lawyer in Cincinnati and Cleveland, who helped write the new law. NEA photo

One-third Vote "No Union"

A National Labor Relations Board study of collective bargaining ballots in June has shown that 32 per cent of the bargaining elections, or 140, were decided in favor of no union. AFL unions won 52 per cent of the month's elections in which they were involved; CIO groups won 55 per cent; and independents won 54 per cent.

The number of elections going in favor of no union at all has been on the increase during the past year. In July, 1946, the percentage of such outcomes was 18.

Rejects Return to AFL

The International Association of Machinists has announced its 600,000 members have spurned "by a large majority" a plan to return to the AFL. A complete rift in negotiations was averted, however, when the association indicated it would try again if there were better terms. The organization pointed out that its reunion would occur only "on a basis of equal treatment and equal status with all other AFL affiliates." The union was suspended more than a year ago for withholding its dues.

Huge Equipment Market Is Seen On Small Farms

Manufacturers think small farm operators will buy at least $1 billion worth of machinery for next several years

FARM equipment manufacturers are directing increasing attention to the huge market presented by the small farm. With farm savings up $12 billion over 1939 and a decided trend in mechanization under way on small farms, which account for 60 per cent of the country's farm acreage, expectations are small farm owners will buy $1 billion worth of equipment for at least several years.

That is the conclusion arrived at by the Anti-Friction Bearing Manufacturers Association as result of a survey it recently completed.

Use of tractors is increasing at the rate of about 100,000 annually. One manufacturer reports his 1947 schedule calls for an increase in production of farm tractors of 76 per cent over 1946, increased output of 117 per cent in pick-up balers, 58 per cent for combines, 26 per cent for tractor cultivators, 78 per cent for tractor mowers and 165 per cent for corn pickers.

Influence of the anti-friction bearing in development of mechanized farming is pointed out by the association. Ball and roller bearings have increased the speed of farm haulage from an average of 7 miles per hour to 40. Modern tractors using an average of 20 anti-friction bearings afford finger tip control by the operator. In the side-delivery hay rake from 12 to 20 anti-friction bearings increased the speed of the hay rake to 8 mph, while they are moving wheat and soy bean combines at 5 mph as against 3.5 formerly. Beet harvesters require as many as 25 anti-friction bearings, as also do cotton pickers.

It is reported one-man operation is aimed at in all new farm equipment. One manufacturer is producing a cub tractor plus a line of hook-on wheel-less implements for under $1000. A one-man cotton picker can be bought for $5000 and a one-man combine for $3000.

Couple the advances in farm equipment proper with the steady speed of rural electrification—which means electric kitchens, deep-freeze storage rooms, automatic milking and stock feeding and some 200 other jobs—and one has an idea of the shape of things to come on the nation's nearly 4 million small farms.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Congressional investigations to provide plenty of headline news during period of adjournment. Most spectacular series of hearings starts Sept. 15 and will concern economic studies aimed at developing program to prevent postwar business depression

WHETHER or not Congress reconvenes in the fall, its committee activities will furnish plenty of headline news. Several of these groups plan to conduct full-fledged investigations, featured by public hearings. A number of them will be of importance to business men; the information gathered in these studies will have a vital bearing on the tenor of future legislation affecting business.

Most spectacular program will be a series of hearings starting about Sept. 15 or 16, to be conducted in a number of key cities by two or more subcommittees of the Joint Committee on the Economic Report. The purpose, according to Sen. Robert A. Taft (Rep., O.), chairman of the joint committee, is to obtain first-hand data on cost-of-living trends and submit a report to Congress, with recommendations, next January.

But the real goal is of much more penetrating nature. Ever since the joint committee was formed early this year it has been striving to map out an approach toward its real objective; that is the development of a national program which will prevent, after World War II, the disastrous depression which always has followed in the wake of major wars, or at least minimize its impact on the country's economy.

Efforts Unsuccessful

So far the efforts of the joint committee economists—Dr. Charles O. Hardy and Fred E. Berquist—to get some sort of agreement among the country's professional economists as to a long-range economic program has been a dismal failure. These two men now are preparing the ground which they will attempt to cover in the coming hearings. They hope at least to make a beginning at developing an over-all, long-range economic program for the country. Incidentally, the committee now is dickering with another well-known economist who probably will be added to its staff in time to take a part in the fall program.

Another investigation will aim at uncovering what is wrong in the housing situation. Instigated by Senators Joseph R. McCarthy (Rep., Wis.), Chapman Revercomb (Rep., W. Va.) and John J. Sparkman (Dem., Ala.), it is to be conducted by 14 members of the House and Senate Banking & Currency Committees. Though the agenda has not yet been frozen, the investigation is intended by its sponsors to take on the nature of a probe. The effect of building code restrictions, of union make-work practices and of union-employer monopoly practices upon building costs will be studied. The intention is to come up with a report to assist Congress in legislating a comprehensive housing measure next year.

To give Congress time to conduct this study and otherwise prepare comprehensive legislation, the Congress has approved the President's Reorganization Plan No. 3 as a temporary measure. This plan creates a new central agency, the Housing & Home Finance Agency. The administrator of this new agency will supervise and co-ordinate the activities of the three existing groups of housing agencies—those that come under the Federal Home Loan Bank System, Federal Housing Administration, and the Public Housing Administration.

Leader in the fight for approval of the new peacetime housing merger, incidentally, was that former machine tool executive, Sen. Ralph E. Flanders (Rep., Vt.). Unless Reorganization Plan No. 3 was approved, he said, we would have a return to the sad state of 1942 when 18 government agencies were in the housing field and competing against each other. Approval of the plan, he said, would prevent a return of disorganization in this picture during the period required by Congress to develop a permanent policy.

Another important study ahead is aimed at developing a comprehensive aviation program to lift the aircraft manufacturing industry out of its present desperate condition and place it on a healthy basis. Originally Congress intended to set up a single group—a National Aviation Council with members from all interested groups. But President Truman jumped the gun by creating an Air Policy Board with the following membership: Chairman, Thomas K. Finletter, New York attorney; vice chairman, George P. Baker, transportation professor at Harvard University; Henry Ford II, president, Ford Motor Co.; Palmer Hoyt, Denver newspaper publisher; and Arthur D. Whiteside, president, Dun & Bradstreet Inc., New York. This board is to make its recommendations to the President early in 1948. The congressionally-created National Aviation Council, which originally was to include the President's appointees in its membership, now will consist of 10 senators and representatives who are to study national defense, commerce, postal and other aviation needs and make a report to Congress by next Mar. 1.

Also slated to get under way this fall is a thorough probe of the whole Social Security system. This is to be conducted by experts, still to be employed, of the Senate Finance Committee. While social security measures, like all tax matters under the Constitution, must originate in the House, Senate leaders want to be better prepared for intelligent action when the House sends over a bill next year. The problems to be investigated are: 1—Extension of the system to millions not now covered; 2—possible revision of the scale of old-age and unemployment benefits to compensate for increases in living costs; 3—administrative problems and methods of financing; 4 — introduction of new forms of social insurance such as sickness and disability benefits.

Starting in November the House Ways & Means Committee will hold a final series of hearings in Washington on the proposed new Internal Revenue Act of 1948. At that time the committee will reach decisions in regard to many suggested changes in the present tax system. The intention is to have the bill ready to be dropped into the House hopper as soon as Congress convenes next January.

To Study Wage Level

Another series of fall hearings will be held by the House Education & Labor Committee. Main purpose will be to reach a determination as to how much beyond the present 40 cent level the minimum wage shall be elevated. The committee announces it also will hold hearings on other subjects but has not yet outlined them.

A fall investigation ordered by the Senate Rules Committee at the instance of Senator C. Douglass Buck (Rep., Del.) will have to do with the operation of the Reconstruction Finance Corp. and, according to Senator Buck, is to be "full and complete." Purpose is to pave the way for a decision as to what to do about the RFC after its expiration date June 30, 1948. One of the angles to be studied is the place of the RFC in taking care of the financial needs of small business.

The "watchdog" committee to observe the operation of the new Labor-Management Relations (Taft-Hartley) Act of 1947, also may come into action some time after the new act goes into effect on Aug. 22. This is a 14-man House-Senate committee, headed by two hard boiled legislators. Sen. Joseph H. Ball

Quick-change Artist

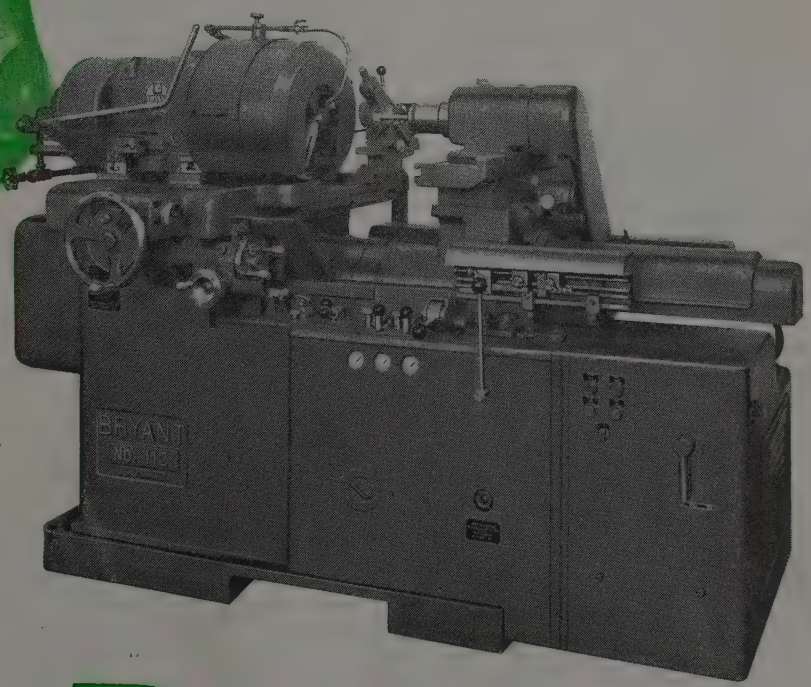
There are many design and construction features that make the Bryant No. 112 precision internal grinder a *"Quick Change Artist"*—make it easy to set up or change over to suit a wide range of jobs.

Quickly adjusted cycle controls for wheelslide—Selection of cycle phases either manually or automatically through main wheelslide control. Independent setting of wheelslide traverse for wheel dressing and grinding by two convenient hand throttles. Universal stop rod positions wheelslide for face grinding. Positive locking reversing dogs for setting grinding stroke quickly. Belt driven wheelheads; Hi-Frequency wheelheads for speeds up to 100,000 R. P. M.

Work spindle designed for operating efficiency—Rigid setting for taper grinding up to 90° included angle, provided by double circular slide mounting. Infinite spindle speeds from 100 to 1000 R.P.M. Quick interchange of chucks, holding fixtures and face plates provided by American Standard Type Cam Lock Spindle Nose.

Three cross feed controls for versatility—Fast set-up provided by rapid traverse cross feed. Increased output on long runs with power cross feed control. Accurate size control through precision feed dial.

These are the highlights that make set-up of the 112 simple and change-over fast. When combined with the basic features available in all Bryant grinders, they add up to less down time, more accurate work, finer work finish and faster production. If you are interested in a *"Quick Change Artist"*, write today for the No. 112 catalog.



Another BRYANT Postwar Development

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BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

BRYANT

STUDY EUROPEAN AID: Special nonpartisan committee of national leaders, headed by Secretary of Commerce Harriman, appointed to determine the capabilities of the United States to assist foreign lands. Standing, left to right: Hiland Batcheller, Pittsburgh; Robert Koenig, Indianapolis; Chester C. Davis, St. Louis; Calvin B. Hoover, Durham, N. C.; John L. Collyer, Akron; Edward S. Mason, Cambridge, Mass.; Melville F. Coolbaugh, Golden, Colo.; Paul G. Hoffman, South Bend, Ind. Seated: Harold G. Moulton, Washington; W. Randolph Burgess, New York; Owen D. Young, Van Hornsville, N. Y.; George Meany, Washington; W. Averell Harrimah; James B. Carey, Washington; Robert M. LaFollette Jr., Washington; Granville Conway, New York. NEA photo

(Rep., Minn.) is chairman and Rep. Fred A. Hartley Jr. (Rep., N. J.) is vice chairman.

Another group that will go into action this fall, even though it is not due to report until "10 days after the 81st Congress convenes (in 1949)," is the new Commission on Organization of the Executive Branch of the Government. Just as Messrs. LaFollette and Monroney through their Legislative Reorganization Act of 1946 contributed on a notable scale to streamlining the activities and organization of Congress, so the new commission is expected to develop ways and means for reducing the number of government agencies and for introducing greater efficiency in the executive branch. This is the commission which includes in its membership the following: Former President Herbert Hoover; James Forrestal, Secretary of Defense; Dr. James K. Pollock, University of Michigan; Joseph H. Kennedy, former ambassador to Great Britain; Dean Acheson, just resigned as Under Secretary of State; Arthur S. Fleming, civil service commissioner; George H. Mead, industrialist, Dayton, O.

Social Security Tax Frozen

When Congress on July 24 again froze the social security payroll tax at 1 per cent against employers' payrolls and the same rate on employees' wages, Rep. Daniel A. Reed (Rep., N. Y.) pointed out that Congress had been enacting such freezes repeatedly ever since the Social Security Act became a law, and warned that this is the last time such a freeze can be tolerated. Accumulated benefits building up under this old-age and survivors' insurance program, he said, make increased tax rates mandatory.

Congress froze the existing rate of 1 per cent until 1950 when it is to go to 1.5 per cent. The new law calls for a further increase, in 1952, to 2 per cent, which rate is to continue without change thereafter.

The new law continues the increased federal contributions, approved in 1946, for federal-state benefits to needy aged persons, the blind, and dependent children.

Small Business Given Chance

By the passage of S. Con. Res. 14, Congress urges the President, members of the cabinet, and other officers of the government to accord small businessmen adequate representation on "government commissions, boards, committees or other agencies in which the interests of the American economy may be affected, and to include small businessmen in such bodies and agencies as are created by executive appointment."

Debate disclosed the claim that there are 3,650,000 small business firms in the United States, "owned by an average of 2½ persons, or a total of 9,125,000 persons" and that this group comprises per cent of our entire economy, and ploys about 65 per cent of all com cial and industrial wage earners and duces about 45 per cent of our e output of commodities."

Hence small business should equal representation with labor, culture, and other groups on those ernment-appointed bodies that shape economic policy as a resul their studies and recommendations.

Reclamation Bureau's Funds

Despite the sharp reduction in the terior Department's appropriation w was sent to the White House in the ing days of Congress, there will continued good market for manufa ers of equipment used on projects o Bureau of Reclamation. Interior gether received for fiscal 1948 $1 587,859, or roughly $100 million than asked in the President's budget this, Reclamation's share was $89,5 038. Counting a carryover of $1 878,000 from last year, this gives R mation $201,400,000 for the co year.

St. Lawrence Seaway

The St. Lawrence Seaway proje dead as far as this session of Con is concerned. Chairman Dondero o House Public Works Committee said committee wants to hold additional h ings next year. Chairman Vande of the Senate Foreign Relations Com tee, when the committee on July 18 proved the project by a vote of 9 said that a report will not be filed "the next regular session" to give minority time to file its views.

Foreign Patent Time Extende

One of the important bills that passed by Congress at the last m was H. R. 3958 giving foreign inve until Feb. 28, 1948, to file patent a cations in the United States on in tions patented in their own countri any time during World War II. cause of the fact that many cou were cut off by the war, the Boyki had given foreign inventors until 8, 1947, but complaints were made the 1947 date would allow insuffi time.

Low-Grade Beryl Ores

Low-grade western beryl ores been successfully concentrated by r ods developed at the Intermountain periment Station, Bureau of Mines, Lake City, Utah. Detailed inform has been published in Report of In gations 4071, copies of which may be by addressing the bureau, Washin

Scientists and Professional Men To Administer New Science Act

New agency to be headed by chairman selected by board from among its members rather than by career governmental official. Seen sharp departure from normal governmental policy. Group will have carte blanche in all research except atomic energy

BUSINESSMEN and scientists should e pleased with the wording of the new ational Science Foundation Act, sent the White House on July 22, for it ntains provisions pretty largely which ey had recommended.

In one respect it marks a sharp dearture from normal governmental prace. The new agency is not to be adinistered by a career government offial directly responsible to the President d to Congress. Instead, the 24 scients, engineers and professional men who, nomination of the President and with e approval of the Senate, will compose e foundation which will run the whole ow. The 24 men will elect, from their mber, a chairman and a vice chairan. They will elect and appoint a rector who will be the foundation's ief executive officer. They will elect, m their own number, a 9-man exutive committee which will prescribe e duties of the director.

Once a year an annual report will be bmitted to the President and to Coness—and this will be prepared by the oundation" rather than, as usually is e case, a chief administrative officer.

President To Select Members

In making selections for the membership of the foundation, the President is quired to give "due consideration" to minations of the National Academy of iences, Association of Land Grant Colges & Universities, National Association State Universities, Association of nerican Colleges, or by other "scientific educational" organizations.

The foundation has carte blanche in fields of research excepting that of omic energy; that sector is reserved to e Atomic Energy Commission. The undation's mandate is to "strengthen ndamental research and education in e sciences, including independent reearch by individuals, throughout the ited States, including its territories d possessions, and to avoid undue conntration of such research and educan."

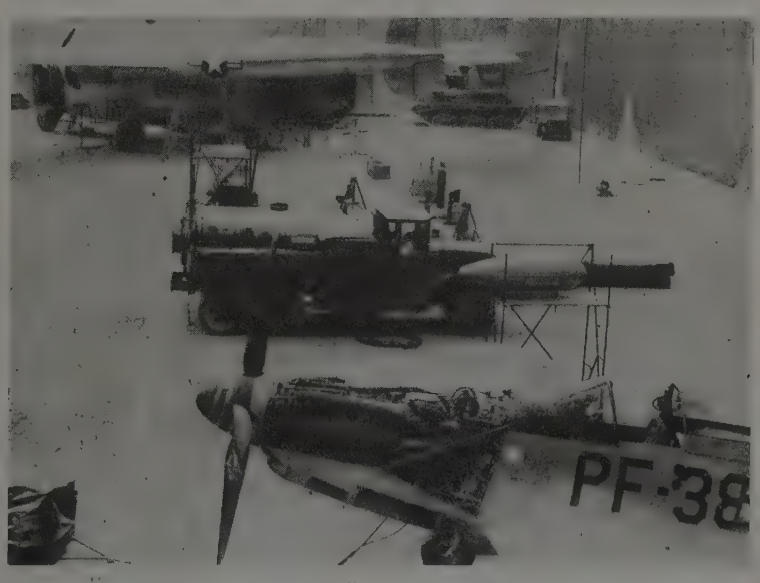
To carry out this mandate it has comte authority to make its own rules, ke expenditures, enter into contracts d other arrangements, make advance yments, acquire real and personal operty of all kinds by purchase, lease loan, publish scientific or technical information or arrange for such publication, accept services of voluntary or uncompensated personnel, etc. The director is authorized to employ technical and professional assistants, "without regard to the civil service laws or regulations, and may fix their compensation without regard to the Classification Act of 1923 as amended."

The foundation, says the act, will be "supreme," to "formulate, develop, and establish a national policy for the promotion of basic research and education in the sciences." It may "initiate and support basic research . . . . by making contracts or other arrangements (including grants, loans, and other forms of assistance)". It may "grant scholarships and graduate fellowships, foster interchange of scientific information among scientists in the United States and foreign countries, correlate the foundation's scientific research programs with those undertaken by individuals and by public and private research groups." The act stipulates that the foundation establish and conduct a Division of National Defense, but leaves to the judgment of the scientists, the question of setting up divisions of medical research, mathematics, physical and engineering sciences, biological sciences, and scientific personnel and education.

The foundation is authorized to co-operate in international research activities, but only with the approval of the President and through the Department of State; this is one of the very few limitations of its authority. The foundation may send delegates to international scientific and other meetings.

The Patent Title gives the scientists wide latitude in regard to patent policies. Each contract or other arrangement, says the act, shall include "provisions governing the disposition of inventions produced thereunder in a manner calculated to protect the public interest and the equities of the individual or organization with which the contract or other arrangement is executed."

The foundation is named as the successor of the Office of Scientific Research & Development, which wartime agency is abolished by the act. The act establishes an Interdepartmental Committee on Science in the government in which the normal scientific activities of the government are concentrated—and the foundation will have no authority over scientific programs of the purely governmental agencies.



"CLIMATIC HANGAR": Practically every weather condition known to man can be simulated at this "climatic hangar" now in operation at Eglin Field, Fla., by the Army Air Forces. Above is an interior view with a North American P-51 in the foreground, gasoline truck in the middle, and Fairchild C-82 in background. Replete with all-weather room, stratochamber, hot and cold test rooms, jungle, desert and tropic-marine rooms, the hangar has a temperature range from minus 70 to plus 165 degrees F

Continued Steel Shortages Face British Plants

Increase in coal allocations not yet reflected in increased output. Transportation difficulties likely to increase next winter

BIRMINGHAM, ENG.

OUTLOOK in the British iron and steel industry is still discouraging to manufacturers and consumers alike. Recent utterances by government spokesmen have only served to emphasize the country's grave economic position. They do not indicate how industry is to get over its difficulties during the next few months.

Herbert Morrison, lord president of the council, made little reference to the steel industry in his latest speech except to say that the increased allocation of coal had not yet had time to show itself in production figures. He declared as satisfactory the general production of steel ingots and castings at a weekly average rate of 254,000 tons for June. This is the highest weekly average this year but below the best figures last year.

Transport Difficulties Probable

What matters more is the warning he gave as to transport deficiencies which are likely to be encountered. Wartime neglect is responsible for 12 per cent—against 3 per cent in 1939—of the rail cars being constantly under repair. Much depends on the severity of next winter. An improved turn-round of cars will enable the railroads to move coal supplies, but bricks, cement, iron ore and steel are the commodities most likely to suffer. It will take two or three years to solve the problem by building the necessary number of trucks. Meanwhile the rate of repair is to be increased and the rate of turn-round accelerated. The five-day week, now largely adopted in British industry, has hindered loading and unloading, and Mr. Morrison threw out a hint that industry, with the co-operation of the trade unions, might plan to unload on Saturdays while the shortage remains acute.

Another aspect of government policy was indicated recently in a reply in the House of Commons on exports of structural steel, foundry equipment and machinery. Government policy, it was said, is to make as large a contribution as possible from all industries to the export drive while assuring to home industry supplies for their re-equipment and development. The percentage of foundry equipment exported is low. Structural steel work is exported almost entirely for projects of urgent importance to British economy. The various allocations are periodically reviewed as supplies are assessed. The issue of allocations is now being resumed in the light of the expectation of the improved supplies of coal to the steel industry.

Heavy steel prices for export have been advanced by £1 per ton and small steel bars and light sections by £2. These increases are not expected to have any visible effect on overseas demand. In fact many overseas inquiries have to be turned down.

Modest increases in steel quotas have been promised to the shipbuilding and automobile industries, as well as the maintenance of minimum deliveries to other trades, but this will be dependent upon an expansion of output in the next few months. August, however, is a holiday month and little change can be expected before this autumn. Prospects of increased supplies of semifinished steel for the use of re-rolling mills are not bright. Little can be expected from the continent of Europe, and it is realized here that America is not in a position to spare much steel after her own requirements have been satisfied. The original goal of an import of 1,500,000 tons of semifinished steel in 1947 has been reduced to one-third of that amount, and re-rollers are taking up all available supplies of defective billets, crops and any other material which is capable of being put through the mills, so as to eke out their limited tonnage of primes. Under these conditions output of light sections, bars and sheets is well below optimum lev and the export quotas of small b have had to be reduced.

Deliveries of fuel have been on slightly better scale in recent weeks of course this is the time of year wh there is little pressure to supply hou hold fuel.

Pig iron produced remains on same level. The supply of coking c is short with the result blast furn capacity is not fully engaged. Foun grades of pig iron are in limited sup and this causes difficulty in the fo dries making light iron castings. Th commitments are increasing. Stringe is equally marked in other grades iron such as those used for the he engineering foundries.

LOADING BAUXITE IN URALS: The Krasnaya Shapochka (Red Riding-Hood) bauxite bed in the northern Urals is reported to be one of the world's largest. Tapped during the war years, it now is undergoing further development, made difficult by peculiar geological conditions of the area. Photo shows loading of ore at the mines. Sovfoto

Department of Commerce Gives New Export Quotas

Office of International Trade, Dep ment of Commerce, announces exp quotas for the third quarter of 19 covering certain commodities for wh specific quantitative limitations have b established. Except where otherwise in cated, units are short tons. The quo are as follows:

Commodity	Qu
Steel sheet bars and tinplate bars containing no alloy	4,
Steel bars, cold finished, nonalloy, 1 in. and under	15,
Concrete reinforcement bars	35,
Other steel bars (hot rolled) containing no alloy, 1 in. and under, except tool steel and specialty steel	15,
Wire rods, except specialty steel	15,
Plate, except fabricated containing no alloy	100,
Iron, steel sheets, galvanized (licenses to be limited so that no more than	

25 per cent of quota will be in gages 22 and lighter)	5,000
eel sheets, black, ungalvanized (hot and cold rolled included) containing no alloy; with less than .40 per cent carbon content)	100,000
on and steel strip (cold rolled, containing no alloy) with less than .40 per cent carbon content, except strapping)	7,000
on and steel strip, hot rolled, containing no alloy, with less than .40 per cent carbon content	15,000
nplate and taggers' tin	140,000
gles except fabricated: (except bulb angles), channels and beams, 6 in. and under	10,000
etal lath (in dollars)	300,000
etal fabricated door frames (in dollars)	400,000
st iron pressure pipe and fittings	3,500
st iron soil pipe and fittings	750
elded black pipe, steel (licenses to be limited so that no more than 40 per cent of quota will be for butt- and lap-weld pipe)	22,000
elded galvanized and black pipe, wrought iron	2,000
elded galvanized pipe, steel (licenses to be limited so that no more than 40 per cent of quota will be for butt- and lap-weld pipe)	8,000
on and steel wire, uncoated (plain, stainless and alloy steel included)	20,000
oven-wire screen cloth, of all metals and alloys; Insect. (in sq ft)	5,000,000
ils of all kinds	7,000
arm-air distribution pipe and fittings (in dollars)	100,000
fined copper, bus bars only	50
pper pipes and tubes	500
pper plates, sheets and strip	1,000
pper rods	200
pper wire, bare	925
bber-covered wire	1,100
eatherproof wire	780
her insulated copper wire (magnet wire limited to 450 tons per quarter)	4,000
ass and bronze, scrap and old (not over 65 per cent copper and none of this scrap shall contain more than 5 per cent tin)	5,000
ass and bronze ingots (not more than 10 per cent of quota shall contain more than 5 per cent tin)	2,000
ass and bronze bars, rods and unfinished shafting	3,000
ass and bronze blanks, plates, sheets, strips and circles	1,000
ass and bronze pipes and tubes (including pipe coils)	380
ass and bronze pipe fittings	50
re, bare and insulated, brass and bronze	200
onze structural shapes, castings forgings	300
d pigs and bars (including blocks and ingots)	300
d sheets and pipes (including ends)	300
d solder (tin content shall not exceed 30 tons)	100
d type metal (antimonial lead)	500
d foil and lead tin	50
d plate, or battery plate, not assembled as complete battery units	300
d castings; caulking yarn; circles; disks; flanges; plugs; powder; rings; roof flanges; sash weights; scale weights; shots; shrapnel; sinkers; strips; tape; washers; weights; wire; wool	50
metal in ingots, pigs, bars, blocks, slabs and other forms	15
c cast in slabs, pigs, or blocks, high grade, containing not over .07 per cent lead, not over .02 per cent iron, not over .07 per cent cadmium, no aluminum and at least 99.90 per cent zinc electrolytic only	500
c photoengraving sheets	400
c sheets, n.e.s. and strip	3,000
c die castings	325
c photoengraving plates, unfinished (include plates containing 20 per cent or more zinc)	300

Belgian Steel Production Tends Upward; Now 80 Per Cent Prewar

Backlogs continue extended in face of heavy demand. Inquiries for steel being placed in United States and United Kingdom. Shortages delaying reconstruction and expansion and modernization of industrial facilities

LIEGE, BELGIUM

TREND of Belgian steel production is on the upgrade. Present monthly output represents about 80 per cent of the average prewar output based on the years 1936-39, and is about 230,000 metric tons. Export trade for steel products and for products mainly made of steel also is increasing and order books are filled for long periods ahead. Backlogs, which had been slightly reduced at the end of 1946 and the beginning of 1947 are now more or less stationary.

Certain products are so difficult to obtain from the Belgian works within reasonable time that inquiries have been placed abroad, particularly in America and Great Britain. However, British deliveries are, if anything, more extended than is the case in Belgium and British prices have increased, so that imports from Britain seem to be losing ground in favor of American, although imports from America are hindered by formalities, especially owing to currency restriction.

Reconstruction Stimulated

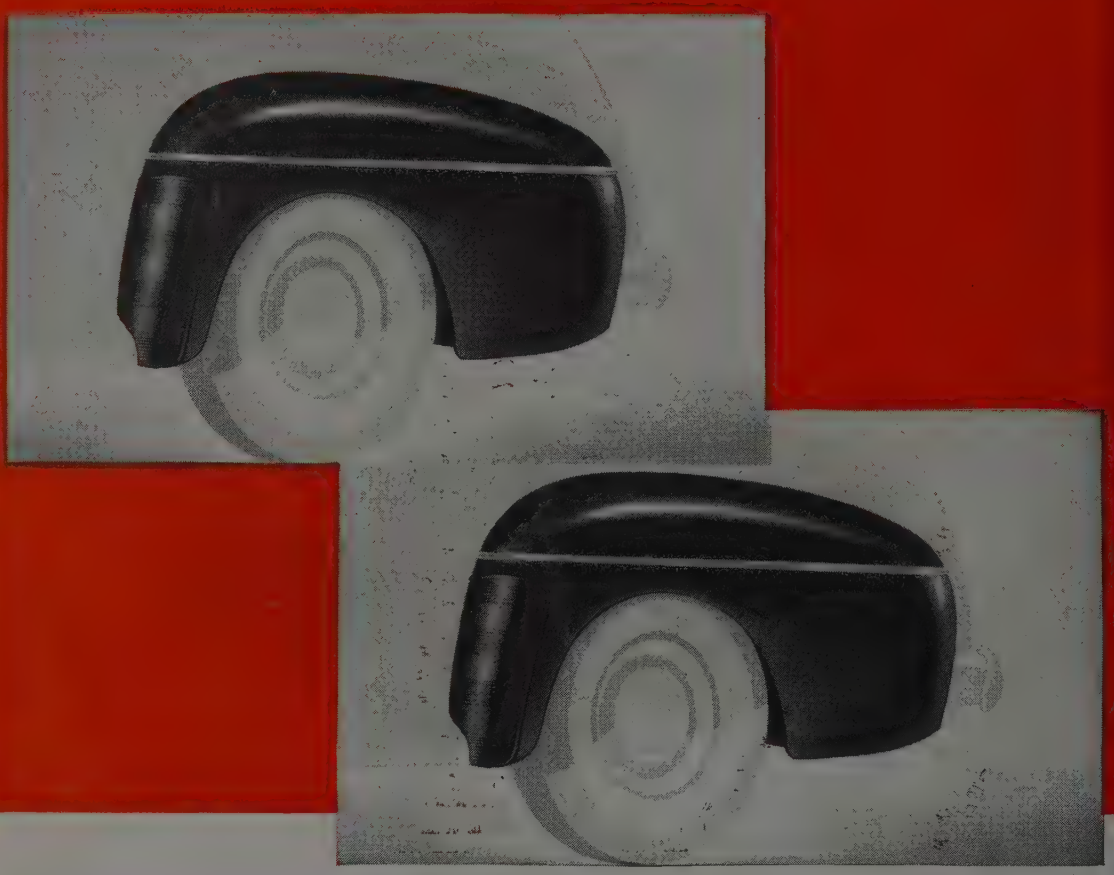
With the return of fair weather the large program of Belgian reconstruction has been stimulated. This includes the electrification of 1500 kilometers of railroad tracks. Work is also active on bridges, roads, housing, etc., all fields where steel is a main constituent. This activity has naturally stimulated the demand for iron and steel products. It is estimated that it will be another year before the Belgian domestic requirements can be reasonably satisfied without restricting the export trade.

Many works are proceeding with their program of extension and modernization, but progress is slow owing to the shortage of material and to the difficulty of putting up the large capital required. The economic union between Belgium, Luxemburg and Holland, which will be known as BENELUX, is expected to improve commercial exchanges between the three countries, and a number of concerns are preparing to take advantage of this eventually.

Provisional figures have been issued showing the relative values of Belgium's and Luxemburg's exports and imports. As regards imports, these come mostly from America and Great Britain, almost to an equal value. Then comes France, the Netherlands, Switzerland and Sweden in order of importance. The principal markets for Belgian and Luxemburgian exports are, in order of importance, the Netherlands, France, Switzerland, the United States, Great Britain, Denmark, Sweden. The nation with which exchanges are the greatest is America; imports into Belgium from that source consist mainly of raw materials, heavy machinery and foodstuffs, and the same applies to imports from Great Britain. As to exports, there always have been close commercial relations between Belgium and her neighbors, France and the Netherlands. With regard to Switzerland, it would seem that this country is buying from Belgium those products that she used to obtain from Germany and Italy before the war. Moreover, the Swiss are often in competition with Britain and America in trade with Belgium, and in many cases, Switzerland succeeds in selling machinery to Belgium due to the shorter deliveries the Swiss can offer. Finally, a considerable amount of raw materials and foodstuffs come from Belgian Congo and it is interesting to note that the volume of such imports is nearly double that of 1938.

The strike that had started in the Charleroi district a month ago spread throughout the whole country, affecting the collieries and metallurgical and engineering works. This amounted almost to a general strike which lasted 24 hours; however, the Conférence Nationale du Travail, the national body dealing with labor conditions, arrived at a settlement on the following lines: (1) Publication of a cost of living index; (2) reduction of taxation; (3) an increase of 10 per cent of family allowances; (4) issue of vouchers allowing workers to purchase a certain amount of household goods for a nominal price; (5) adjustment of certain categories of wages; (6) increase of "festive" days from 8 to 10, on a paid basis, and over and above regular holidays with pay; (7) increase of the holiday pay allowance. The demands of the workers had been for a cost of living bonus of from 350 to 500 francs ($7.95 to $11.35) per month. The concessions made seem to have largely met labor's demands without substantially damaging the nation's economy.

Sure, they LOOK ALIKE from where you sit



. . . but what a difference under the paint!

One of those gleaming new fenders is regular low-carbon steel; the other is N-A-X HIGH-TENSILE.

Because of the high yield strength of N-A-X HIGH-TENSILE, fenders and similar parts made of this steel will be considerably more resistant to denting. This characteristic, combined with other desirable properties of N-A-X HIGH-TENSILE, assures longer life with less maintenance cost.

N-A-X HIGH-TENSILE's finer grain structure and higher hardness make possible a better finish without costly surface preparation.

N-A-X HIGH-TENSILE's higher corrosion (rust) resistance means that the fender will keep i new-car look and style much longer.

From any angle you look at it — manufacturer' fabricator's, owner's—the N-A-X HIGH-TENSIL fender is far and away the better buy!

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N·A·X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION
N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION

Mirrors of Motordom

Where will the rising spiral of wages and prices end? Eventually buyers may renege or turn to substitutions and the dream world of high purchasing power will collapse. Consumer must pay the bill, whether for higher rates, pensions or welfare funds

By FRANK RISING
General Manager
Automotive & Aviation
Parts Manufacturers Inc.,
Detroit

ONE of the commonest questions hich follow large events in the labor lations field—such as the recent tting of the jackpot by John Lewis the announcement that Ford and the AW-CIO were working out a big nsion plan—is, "Where will it end?" By that the questioner means he is ginning to lose track of things, can't ink them through, and is not only zzled but worried about the eventual teration, disorganization, or even dis- ption of the standards by which his e has been directed.

It is worthwhile, if only for the exer- se it gives the brain cells, to speculate out where some of our trends in ion-management relations are lead- g. Let us take a look at the coal fields a starter:

The miner is getting along pretty ell. He has been guaranteed more oney for digging coal than he ever ceived. He has a stake in a huge fund many millions of dollars set aside for s "welfare and retirement." He doesn't ve to work any harder, and only ght-ninths as long; he doesn't have to g any more coal to get all this.

Looks pretty good. . . but let's carry a little further. What's the money od for? To buy clothing, food, medical lp, education, housing, of course. Any rk would know that. More money will y more of it, won't it? Or will it?

This is where the miner should ac- ire a slight frown, although he prob- ly won't. To tell the truth, the initial fect is that more money *will* buy more those good things—if he hurries.

Eventually, of course, the doctor has have more money for his work. . . ecause he has to pay more for the al to heat his home and office. The acher, the clothing maker and dis- ibutor, the food suppliers, all the st of the people have to have more. hey use coal, too. The tax collector as to have more, because a couple of illion people on the government pay- ll use coal, and food, and clothing, nd housing.

It is quite a headache. To make it orse, a lot of people won't like to pay a higher price for coal, and as soon as they can they will find some way to use less of it, or none of it. They won't like to pay more for steel, either, or steel products. They will ride less frequently on the coal-consuming and consequently expensive railroad trains.

For the moment, it is at least evident that the boost in "purchasing power" of the miner is accompanied by a cut in "purchasing power" of the coal consumer. But that is not the whole sequence; around the corner will come substitution of other things for coal, steel, and anything which gets higher and higher in price relative to the things which don't go up in price as much or as fast.

You won't see it happen all at once; it will happen gradually. But it will happen, unless the same increase in price, because of the same increase in costs, is extended to all the substitutes.

This, then, is the miner's eventual position: Either the price of everything he buys goes up and erases any gain in "purchasing power," or the competition of oil, gas and anything else which can substitute for coal reduces his own employment opportunities. What is most likely is that some of both of these trends will develop. Will he then be a gainer, in the long run?

Someone points out, of course, that any change to other fuels will mean the development of new furnaces, new locomotives, new expansions of oil-and gas-producing industries; or, to put it another way, lots of new jobs and new horizons—progress, to put it in one word.

Sure, it is progress all right—for the country at large. But remember that we started to examine the happy miner, exultant in his recent windfall. Is it progress for him?

ANOTHER interesting item for the hot weather season is the Ford pension or retirement plan, and the speculation about the spread of the idea. Pensions or retirement systems, on the whole, are something like mother love and the

GUEST EDITOR

While Detroit Editor A. H. Allen is on vacation, STEEL is presenting articles by three guest editors in the Mirrors of Motordom section, the second of which appears herewith. Frank Rising is general manager of Automotive & Aviation Parts Manufacturers Inc., Detroit, an organization of some 800 suppliers in this field.

FRANK RISING

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	441,793	140,738
April	449,388	248,108
May	390,629	247,620
June	418,919	216,637
July	405,000*	331,000
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908
12 mos.		3,268,456

* Preliminary.

Estimates for week ended:

July 12	90,075	74,015
July 19	103,091	80,895
July 26	82,712	84,720
Aug. 2	90,000	79,385

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STUDY U. S. METHODS: A group of British motor car engineers are visiting automotive plants in the Detroit area, studying American manufacturing methods and their possible application in British plants. Shown above at the Briggs Mfg. Co. is an engineer, left, explaining the intricacies of a body "framing" fixture to William Johnson, center, Coventry, England, and John W. G. Pringle, Oxford, England, both divisional managers for Morris Motors Ltd.

American flag. Everybody is for them. To be against them is to be an outcast among your fellow men—a mean and churlish individual.

I'm not against pensions—I'd like to have one myself. With no inside information at all I can guess the reasons why large business firms are moving toward them. They want to do something about the problem of superannuation and deterioration of personnel; they recognize the gains to be had in goodwill and reduction of insecurity anxiety among the working force; they know the public goodwill which will be added, and they want industry to lead the way in attacking the national problem of old-age displacement and unemployment.

We might hazard a couple of slants at the subject, though, inasmuch as we are trying to think things through. For one, will the company which sets up the pension plan get the credit—or will the union? Perhaps both will, and the general opinion will be that cooperation has scored a gain. Nothing wrong with that; but after a while how can the union keep its reputation with the rank and file as a militant, fighting advocate of special privilege? (Don't forget—that *is* the aim.)

It seems to me that the union will have to make repeated demands for more additions to the pension, shortening of the time requirements, and all kinds of padding and extra allowances. If it does not, then the pension plan, once adopted, is a dead issue and isn't worth talking about during the annual union drive. We will have only the same demands as before for higher pay, less work, more "fringe" payments.

This brings us back to where we came in, in a way. Again the question of ultimate gain comes up. Where are the dollars coming from? Why, from the consumer, of course. In addition to paying for annual stiff increases in the hourly rate, he is going to pay for pension plans. If he isn't who is? And if you have succeeded in protecting a few against the vicissitudes of old age, what have you done for the many?

Tricky, isn't it?

IF THERE are still any listeners in the hall, or if it is raining outside, we might as well throw another one into the pot for a slow stewing. This is an item which we should talk about more, and which very few of us take the trouble to think about.

It concerns the same "purchasing power" theory which has glittered in the economic sky like the flying disks, darting here and there, exciting everyone, and then vanishing just when you are about to take a picture of it.

Everything nowadays is made attractive with the assurance that it will uphold "purchasing power." Makes good reading, and even better talking. What's wrong with upholding purchasing powe Why can't we have more of it? It obviously the answer to almost a economic problem.

The only point which seems to evaded, although now and then so faltering voice is heard dimly in t background, is, "Whose purchasi power?"

Everybody's? Well, not precisely. course we don't want to raise the pu chasing power of those who have ple . . . .or too much. We don't want increase the purchasing power of capitalists, Old Moneybags. Nor, that matter, is there any sense in ra ing the purchasing power of the co pany. You can see at a glance that company has millions of dollars. Wh we want to do is just increase the pu chasing power of the toilers.

So, that we will do. We will doub it, from 1937 to 1947. Double money paid for the same amount time put in, that is. With double money, the toiler has double the pu chasing power, hasn't he?

No, you say, he hasn't. We have hold the price of everything stea with no increase at all, to double *money's* purchasing power. How c we do that, you say? Don't be stupid by ordering the seller to sell at same price, of course. If he does want to do that, let him go hang. we *must* have his produce, let's s him a little extra money under table—subsidize him. Now we have

Government Pays Subsidy

Who pays the subsidy? Why, gove ment, you fool. Government has money anyhow; you can see that if y take the time to look at a piece of mon . . . says right on it the governm made it out of paper or metal.

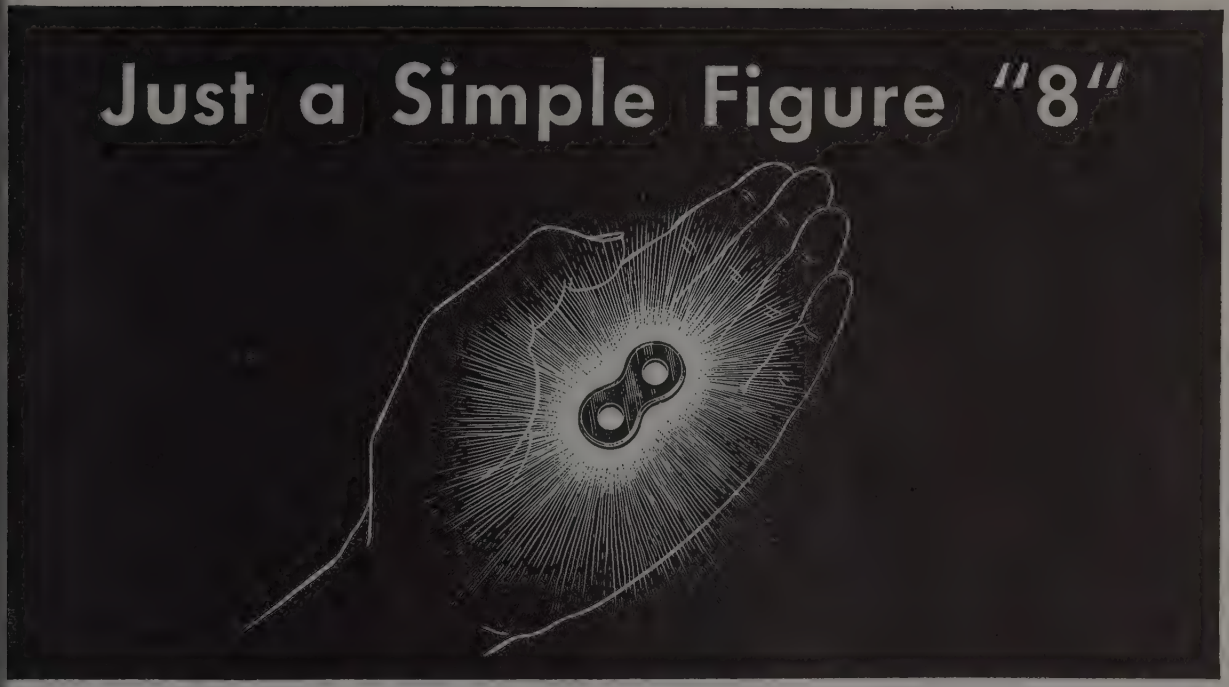
Up to now, perhaps quite a numb of people have fallen off on the curv but there is a worse one ahead. Wh is the "purchasing power" of the co pany and Old Moneybags going come from, after awhile? This is point we said was overlooked, a the one which will really upset applecart.

Old Moneybags (who is actually composite of all the people who savings into business investments) a the company, which is the result such investment, hasn't much purch ing power any more. Sure, the co pany has $7 million, but what can buy with this? It had seven mill dollars in 1937 and bought a new pl —do you think it can do that tod What happened to the purchasing pow

Back we go to Joe Miner. Down the mine, or the bowels of the ea if you prefer Mr. Lewis' terminolo

(*Please turn to page* 156)

Just a Simple Figure "8"



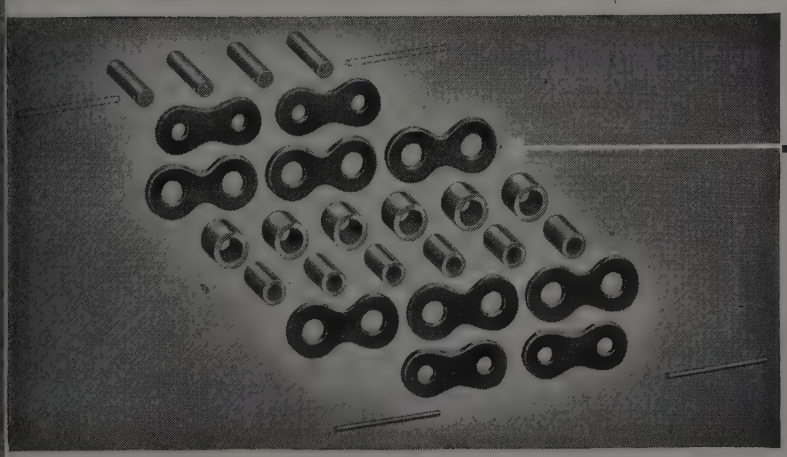
This short length of UNION roller chain is made up of the 28 separate parts shown below

UNION CHAINS

It's simple enough, true—but for all its simplicity its fabrication requires 12 distinct and precise operations. For this is a sidebar of a pitch of UNION roller chain. If you will look at the "exploded" drawing at the bottom of this page you will see that there are 10 of these sidebars (6 inner and 4 outer) in the short length of UNION roller chain shown at the left. You will also see that there are 28 separate parts in this same length of chain. But what you don't see is that it requires 290 operations to make these 28 parts. Nor can you see that every step from receipt of material to finished product is carefully supervised by an inspection department responsible to the engineering division.

Here at UNION CHAIN we make nothing but sprocket chains, sprockets and attachments. All our skill and effort are concentrated on the precision manufacturing of high quality chains of various types for the transmission of power and the handling of materials. We are not yet able to meet the overwhelming demand for UNION chain, but we assure our customers and friends that we are making every effort to do so, consistent always with the character of our product and the complicated processes of its manufacture.

The Union Chain and Manufacturing Company • Sandusky, Ohio



THESE 12 OPERATIONS TO MAKE THIS STEEL SIDEBAR

1. Straighten stock material
2. Pierce pitch holes
3. Blank link contour
4. Coin link edges
5. Stamp name and number
6. Straighten link
7. Broach pitch holes
8. De-grease
9. Heat treat and quench
10. Clean and polish
11. Temper
12. Color

Canadian Firm To Make Farrel-Birmingham Line

Connecticut maker of heavy equipment arranges for dominion manufacture by John Bertram & Sons Co.

FARREL-BIRMINGHAM CO. INC., Ansonia, Conn., manufacturer of heavy industrial equipment, gears and gear units, has announced an arrangement with John Bertram & Sons Co. Ltd., Dundas, Ont., Canada, by which Farrel-Birmingham processing equipment for the manufacture of rubber and plastics, phonograph record machinery, rolling mill machinery and hydraulic machinery will be built in Canada.

The affiliation joins the interests of two of the oldest machinery manufacturing companies on the North American continent. The Connecticut company will celebrate its 100th anniversary next year, while the Bertram firm, oldest and largest machine tool builder in Canada, was founded in 1861.

Similarity between the two is marked in policy and in fact that both companies have remained in control of descendants of the founders.

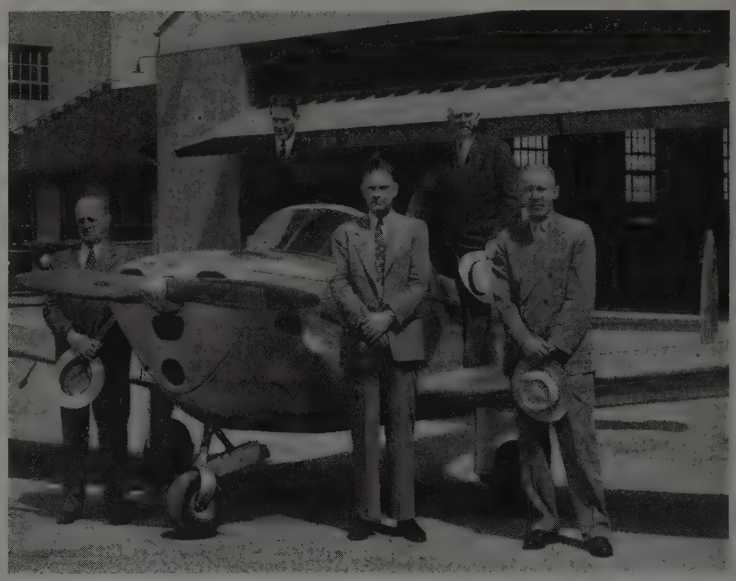
Although products of the two differ, Bertram's facilities are readily adaptable to the manufacture of the several types of Farrel-Birmingham equipment included in the agreement. The Bertram line consists of general purpose and railroad machine tools and metalworking machines, as well as small machine tools and precision gages.

Bertram has sales coverage throughout Canada, and Farrel-Birmingham products manufactured by Bertram will now be procurable through the company's headquarters at Dundas and branch sales offices at Vancouver, Winnipeg, Windsor, Toronto and Montreal.

Pullman Puts Standardized Railway Box Car on Display

A railroad box car which aims at standardization was recently put on display at the Union Terminal in Washington by its maker, Pullman-Standard Car Mfg. Co., Chicago. Although manufacturing on a commercial basis has only just begun at the firm's Michigan City, Ind., plant, orders for the car already total almost 10,000.

By engineering and manufacturing a greater proportion of component parts in its own shops, Pullman-Standard has been able to reduce the price of the car. One structural feature is the use of welding instead of riveting, wherever it is economically advantageous.



GET FLYING START: Committee members planning the Porcelain Enamel Institute ninth annual forum to be held at Ohio State University, Columbus, O., Sept. 10-11, are shown here beside the plane of Dr. A. I. Andrews, Illinois University, a committee member. Left to right: Edward Mackasek, managing director, Porcelain Enamel Institute, Washington; Prof. F. A. Peterson, University of Illinois; R. M. King, Ohio State University; Dr. Andrews; J. E. Hansen, Ferro Enamel Corp., Cleveland

Stock in Davis Co. Bought By Young and Associates

Purchase of a substantial block of Davis Mfg. Co. Inc. common stock by Allan P. Kirby, Robert R. Young and Robert McKinney has been announced by C. J. Davis, president of the farm equipment manufacturing firm, at the annual stockholders' meeting in Wichita, Kans.

Mr. Kirby is president of Alleghany Corp. Mr. Young is chairman of the Chesapeake & Ohio Railway and Mr. McKinney is an investor and rancher of Tucumcari, N. Mex. It is understood that this block of stock acquired by the group for investment represents a one-third interest in the company.

Plans Ultimate Expenditure Of $40 Million on Expansion

General Telephone Corp., Boston, has embarked on an expansion and modernization program involving an ultimate expenditure of $40 million in order to meet an unprecedented demand for telephone service, states President H. V. Bozell.

The company has unfilled orders for 130,000 phones and has 840,000 instruments in service, largest in its history.

WAA Lists More Properties Recently Declared Surplus

War Assets Administration has named more war-time installations which recently were declared surplus. The facilities are listed below by names of the war-time operators and should not be confused with privately-owned properties.

Pacific Car & Foundry (NOBS #636 & 995) Everett, Wash.
General Electric Co. (Plancor #789) Syracuse, N. Y.
Continental Foundry & Machine Co. (Plancor #272) Chicago, Ind.
Continental Foundry & Machine Co. (Plancor #272) Wheeling, W. Va.
Andrews Steel Defense Corp. (Plancors #1114 & 2224) Newport, Ky.
Ozark Ore Co. (Plancor #1998) Ironton, Mo.
Firestone Tire & Rubber Co. (Plancor #127) Akron.
Monsanto Chemical Co. (Plancor #2103) Springfield, Mass.
Bay Petroleum Co. (Plancor #1299) Denver.
Pittsburgh Metallurgical Co. (Plancor #641) Charleston, S. C.
Chandler Evans Co. (Plancor #323) Dayton, O.
Sun Oil Co. (Plancor #1365) Toledo, O.
Domestic Manganese & Development Co. (Plancor #1005) Butte, Mont.
Pacific Tire & Rubber Co. (Plancor #1976) Oakland, Calif.
Lac Chemicals Co. (Plancor #2249) Culver City, Calif.
Wyodak Coal & Mfg. Co. (Bloomington Vanadium project) Idaho.
Clinton Products Co. (Plancor #2060) Clinton City, Iowa.

BRIEFS . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Delano Iron Foundry Inc., Everett, Mass., producer of gray iron castings, has changed its name to Everett Foundry Inc. New owners are Charlton Reynders, president and treasurer, and Russell Swiler, executive vice president.

—o—

Case Institute of Technology, Cleveland, has established a research laboratory for mechanical metallurgy. Dr. George Sachs, professor of physical metallurgy, has been appointed director.

—o—

Tennessee Coal, Iron & Railroad Co., Birmingham, subsidiary of U. S. Steel Corp., recently presented certificates to 50 of its employees in recognition of long service.

—o—

Bureau of Reclamation has ordered three synchronous motors from General Electric Co., Schenectady, N. Y., for the Granby pumping plant of the Colorado Big Thompson project. Each of these motors, rated at 6000 hp, will drive vertical centrifugal water pumps.

—o—

Alabama Department of Industrial Relations reports that there were 1444 Alabama firms last year which reported 121 injuries with 790,681 man-days lost. In 1942 there were 1409 reporting firms with 10,919 injuries for a total of 866,-81 man-days lost.

—o—

Spang-Chalfant Division, Pittsburgh, National Supply Co., has contracted with Lust Furnace Co., Pittsburgh, for a bloom heating furnace with a capacity of 100 tons an hour, to be built for the division's Ambridge, Pa., plant. The division manufactures tubular products.

—o—

Metasap Chemical Co., Harrison, N. J., subsidiary of Nopco Chemical Co., has reduced prices approximately 9 per cent on metallic soaps. This reduction is the third such cut in metallic soaps since April, bringing current prices about 20 per cent below the level at that time.

—o—

Diamond Wire Spring Co., Pittsburgh, manufacturer of wire springs and specialties, has been purchased by A. J. Mazio, formerly associated with Braeburn Alloy Steel Co., Braeburn, Pa.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, announces that vacuum cleaner sales for the first half of 1947 amounted to 1,631,840 units, or 80 per cent of the industry total for the entire year of 1946. The 1947 half-year total exceeds by 9.68 per cent the total sales in 1941, the industry's biggest prewar year.

—o—

Gladding, McBean & Co., San Francisco, manufacturer of ceramic veneers and other construction items, has reopened its plant in Los Angeles.

—o—

Federated Metals Division, New York, American Smelting & Refining Co., was host recently to a group of Purdue University engineering students at its Whiting, Ind., plant.

—o—

Whitney Chain & Mfg. Co., Hartford, Conn., has moved its Dallas branch office and warehouse to 2914 Taylor St. Firm makes foundry equipment, cranes and other equipment.

—o—

Hotpoint Inc., Chicago, manufacturer of household appliances, closed its Chicago area plants and offices July 28 for vacation. Company will reopen Aug. 11.

—o—

Chemical Plants Division, Pittsburgh, Blaw-Knox Co., has moved its headquarters to 321 Penn Ave.

—o—

Raybestos-Manhattan Inc., Passaic, N. J., is making a brake lining for 22-ft brake drums to be used in Europe on hoists of rehabilitated mines destroyed during the recent war.

—o—

M. A. Hanna Co., Cleveland, has merged Evergreen Mines Co., Crosby, Minn., into Hanna Coal & Ore Corp., operating subsidiary of M. A. Hanna's iron ore, docks, vessel and lake coal business. Substantial stock interest in Evergreen Mines was acquired by M. A. Hanna Co. about two and a half years ago.

—o—

Record Machine & Tool Co., manufacturer of oil well tools, has moved from Bakersfield, Calif., to 5742 Bandera St., Los Angeles.

—o—

Acme Metal Products Corp., manufacturer of steel kitchen unit combinations, announces that its mail address has been changed to P. O. Box 237, Blue Island, Ill.

—o—

Whitin Machine Works, Whitinsville, Mass., maker of textile mill equipment, has purchased the plant and equipment of Fay & Scott in Dexter, Me. For the past two years the latter firm had been manufacturing parts for Whitin. The Maine facility, which will continue in full production, will be operated as a subsidiary of the Massachusetts organization.

—o—

General Electric Co., Schenectady, N. Y., reports a total of 249,627 stockholders as of June 20, a record figure which exceeds that of a year ago by 3923. More than 35 per cent of the stockholders own less than 10 shares, the company reveals, and the largest holder, General Electric Employees' Securities Corp., possesses less than two per cent of the stock outstanding.

—o—

Dravo Corp., Pittsburgh, has opened a Chicago office at 208 S. La Salle St. with T. N. Eshbach in charge. The office will handle sales and service of Dravo heaters for commercial and industrial heating and air conditioning units for crane cabs.

—o—

Thermax Division, Louisville, Ky., Girdler Corp., has established a southwestern district office at 5614 Telephone Rd., Houston, Tex. James R. Chapman will be in charge of the office which will handle Thermax dielectric heating equipment.

—o—

Automatic Transportation Co., Chicago, manufacturer of electric industrial trucks, has appointed Jefferds & Moore, Charleston, W. Va., as its sales representative in West Virginia and eastern Kentucky. Wilbur S. Ball, Louisville, Ky., has been named representative for the rest of Kentucky and southern Indiana.

—o—

American Flange & Mfg. Co. Inc., New York, manufacturer of steel insulation, has appointed Midwest Ferro-Therm Distributors Inc., Chicago, as its representative for the midwest and central states areas.

—o—

Paul M. Wiener Foundry Co., Muskegon, Mich., is the new corporate name of Montague Castings Co. There has been no change in ownership, management or location.

—o—

Ward Leonard Electric Co., Mt. Vernon, N. Y., manufacturer of electric control devices, has appointed Durling Electric Co., Baltimore, as its representative in Virginia, south central Pennsylvania, Maryland and Delaware south of Wilmington.

—o—

Mathieson Alkali Works, New York, has adopted an employee insurance and benefit plan to cover all regular employees with more than three months' service. Benefits will be provided at company expense and will include life insurance, nonoccupational accident and sickness benefits, hospitalization, special hospital services and surgical benefits.

Drop in Auto Output Cuts Industrial Index

TEMPORARY curtailment of production by the nation's largest manufacturer of automobiles because of insufficient steel supplies lowered the overall industrial pace in the week ended July 26, with the result STEEL's industrial production index receded 3 points from the previous week. This placed the index at 157 per cent of the 1936-1939 average. High point for this year, and also the postwar peak, was 164 per cent, and low mark for the year was 124.

However, helping mitigate the depressive effects of reduced output of the auto industry to 82,712 passenger cars, trucks and busses was a gain in steel ingot production to 95 per cent of capacity. Ingot production has been continuously on the upgrade since the Fourth of July holiday slowdown and in the week ended July 26 was within 2 points of the postwar peak of 97. With demand for durable goods still running high, the pressure for delivery of steel is unrelieved.

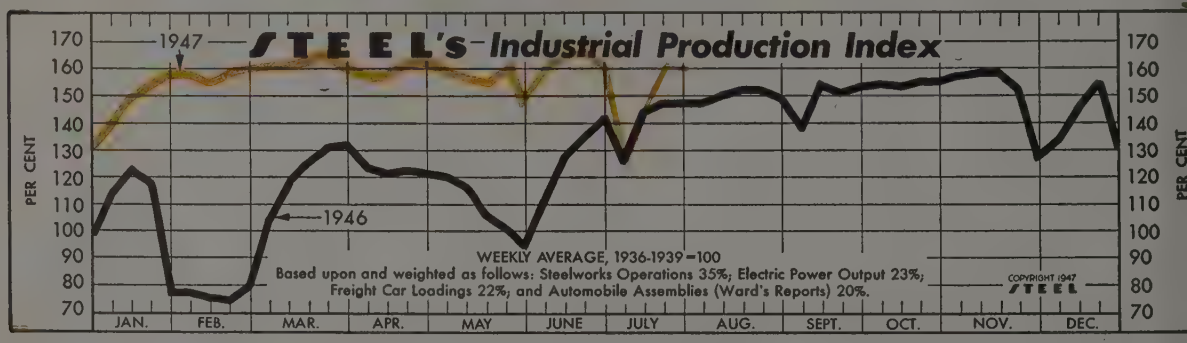
EMPLOYMENT—Helping hold consumer demand at high levels is a consistent rise in employment, the U. S. Commerce Department reporting civilian employment at 60,055,000 persons in June, compared with 58,330,000 in May and 55,390,000 in January. The June level exceeds all monthly figures since the end of the war.

ELECTRICITY—With the nights growing longer and with industrial and commercial activity at a brisk pac consumption of electricity should show an uptrend for th rest of the year. After falling to the year's low of 4,189 824,000 kilowatthours in the Fourth of July holiday wee electricity distribution rose in the two succeeding week the latter one of which saw distribution reach 4,732,434 000 kwhr, highest since the week ended Mar. 22.

CAR LOADINGS — Heavy movement of grain fro bumper crops has pushed railroad car loadings to a hig plane, loadings for the week ended July 19 totaling 919 734 cars, highest since the corresponding week a yea ago when the total was 921,496. Grain and grain prod ucts loadings totaled 71,933 cars, highest since the wee ended Aug. 3, 1929.

COAL — Making progress in restoring production t levels prevailing before the recent coal miners' wor stoppage, bituminous coal mines in the week ended Jul 19 had an estimated aggregate output of 12 million ne tons, compared with only 6,235,000 in the precedin week. Because 1946 also was marked by serious coa miners' strike, the aggregate production in 1947 throug the week ended July 19 was 23.8 per cent ahead of tha for the corresponding period of the previous year.

PETROLEUM—With demand running high for petro leum products, production of crude oil during July wa only slightly below the all-time peak levels of June However, in the week ended July 12 crude runs t stills set a new all-time record of 5,229,000 barrels daily and refinery operations hit a new all-time high of 93. per cent of capacity.



The Index (see chart above): Latest Week (preliminary) 157 Previous Week 160 Month Ago 161 Year Ago 1

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.0	92.5	96.5	86.5
Electric Power Distributed (million kilowatt hours)	4,730	4,732	4,675	4,352
Bituminous Coal Production (daily av.—1000 tons)	2,000	1,039	2,150	2,099
Petroleum Production (daily av.—1000 bbl.)	5,084	5,050	5,109	4,926
Construction Volume (ENR—Unit $1,000,000)	$134.8	$104.4	$143.5	$140.9
Automobile and Truck Output (Ward's—number units)	82,712	103,091	103,203	84,720

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	915†	920	846	911
Business Failures (Dun & Bradstreet, number)	76	63	60	13
Money in Circulation (in millions of dollars)‡	$28,145	$28,225	$28,183	$28,187
Department Store Sales (change from like wk. a yr. ago)‡	+8%	+8%	+3%	+28

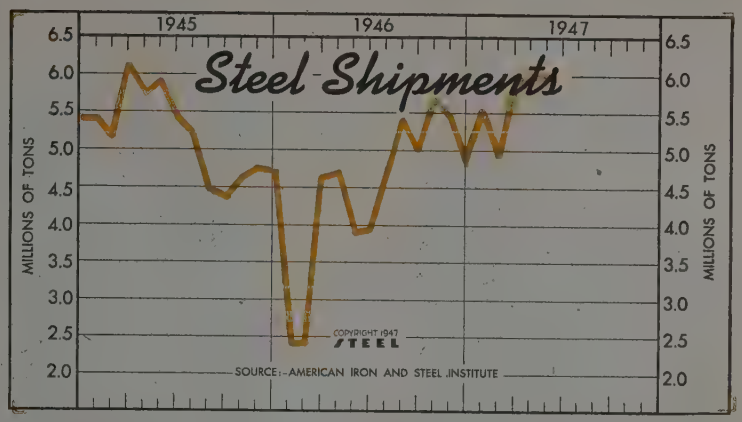
† Preliminary. ‡ Federal Reserve Board.

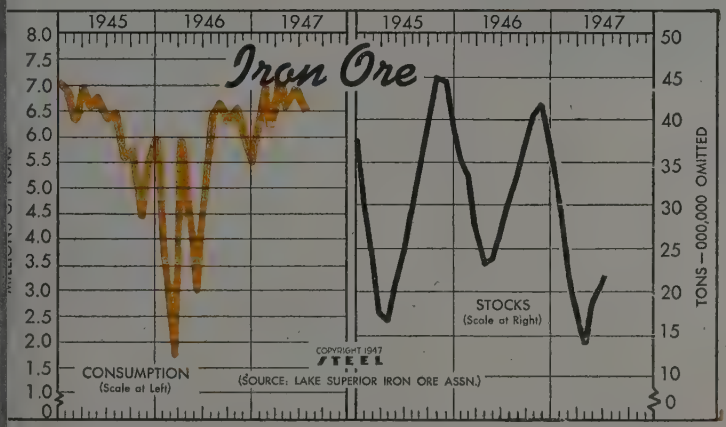
Steel Shipments

(Net Tons)

	1947	1946	1945
ı.	5,527,758	2,391,850*	5,435,647
b.	5,015,934	2,391,849*	5,184,498
ır.	5,798,461	4,644,988	6,179,452
r.	5,909,714	4,698,081	5,769,786
y	5,938,057	3,906,064	5,938,055
ne		3,966,628	5,437,206
y		4,639,610	5,214,074
g.		5,406,470	4,512,637
pt.		4,994,377	4,391,143
t.		5,675,339	4,660,237
v.		5,404,498	4,779,628
c.		4,854,207	4,729,561

* Figures for January and February, 1946, merely averages derived from a report that mbined shipments for those two strike-affected nths into a total of 4,783,699 tons.





Iron Ore

(Lake Superior Iron Ore Assn.)

Gross tons—000 omitted

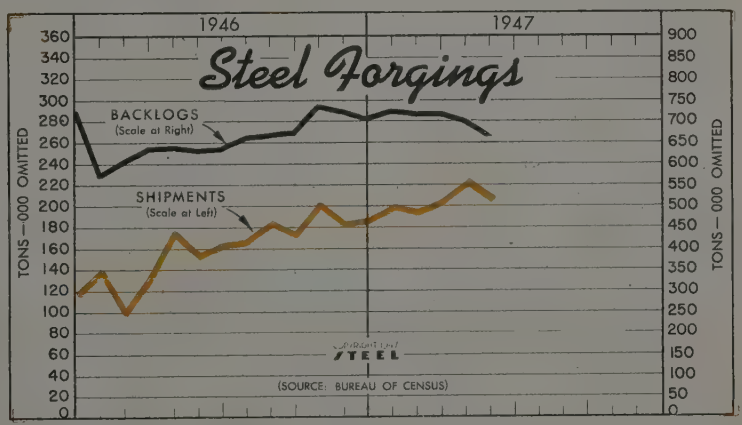
	Consumption		Stocks at Lake Erie docks and furnaces	
	1947	1946	1947	1946
Jan.	7,024	3,719	30,514	35,342
Feb.	6,264	1,748	24,317	33,647
Mar.	6,979	6,021	17,411	27,601
Apr.	6,579	4,769	13,555	23,079
May	6,885	2,990	17,618	23,905
June	6,500	4,995	21,746	26,265
July	....	6,460	.....	30,439
Aug.	....	6,738	.....	34,067
Sept.	....	6,380	.....	37,573
Oct.	....	6,625	.....	40,435
Nov.	....	6,131	.....	41,919
Dec.	....	5,516	.....	37,465
Total	....	62,093	.....	

Steel Forgings

Tons—000 omitted

	Shipments		Unfilled orders*		Consumption of steel	
	1947	1946	1947	1946	1947	1946
	200	141	723	570	285	192
b.	196	101	714	606	287	132
r.	205	134	717	637	296	176
r.	224	178	699	639	325	232
y	211	155	663	631	301	215
e	...	165	...	635	...	227
y	...	168	...	661	...	230
g.	...	184	...	666	...	259
t.	...	174	...	671	...	247
		203	...	736	...	290
v.	...	184	...	727	...	254
c.	...	187	...	707	...	260

* Forgings for sale.



NANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,536	$12,542	$12,600	$12,342
Federal Gross Debt (billions)	$258.8	$258.5	$257.7	$268.3
Bond Volume, NYSE (millions)	$22.2	$26.7	$19.5	$19.4
Stocks Sales, NYSE (thousands)	5,423	5,939	4,336	5,426
Loans and Investments (billions)†	$63.4	$63.2	$55.1	$60.9
United States Gov't. Obligations Held (millions)†	$39,145	$39,099	$34,596	$42,434

† Member banks, Federal Reserve System.

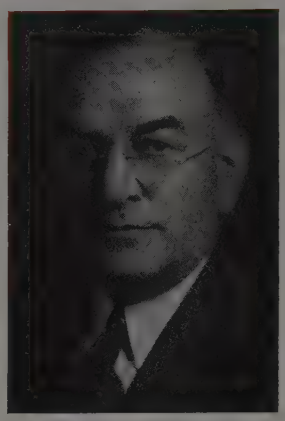
RICES

' STEEL's composite finished steel price average	$69.14	$69.82	$69.82	$64.45
All Commodities†	150.3	148.3	147.8	124.2
Industrial Raw Materials†	165.2	162.0	161.5	141.4
Manufactured Products†	145.1	143.7	142.9	118.9

†Bureau of Labor Statistics Index, 1926=100.

Men of Industry

NICHOLAS BASHARK



ROY E. GREENWOOD

Nicholas Bashark has been appointed staff engineer in charge of aircraft products for the Parker Appliance Co., Cleveland. He will assume direction of the broadened company program of aeronautical equipment development. Before joining Parker, Mr. Bashark had been head of hydraulic and related engineering for Air Materiel Command at Wright Field, Dayton, O., where he served for 11 years.

—o—

Jack Frye has been elected president of the General Aniline & Film Corp., New York, to succeed **George W. Burpee,** retired. Mr. Frye has been chairman of the company, and former president of Trans World Airlines. **W. Benton Harrison Jr.** has been elected treasurer of General Aniline & Film Corp. He formerly had been assistant treasurer.

—o—

Malcom O. Brewer has been appointed eastern district manager of the Printing-Machinery Division, Electric Boat Co., New York. He formerly had been vice president and eastern manager for Vandercook & Sons Inc., Chicago.

—o—

C. Earle Moran, secretary and assistant treasurer, Anaconda Copper Mining Co., New York, has been elected treasurer of the company to succeed the late **J. E. Woodard.** He continues as secretary.

—o—

Frederick J. Riker, former manager, Forge Blanks Division, Crucible Steel Co. of America, New York, has been named president of Livingstone Engineering Co., Boston. He succeeds **Carter C. Higgins,** who has been elected chairman of the board. Mr. Higgins is vice president of Worcester Pressed Steel Co., Worcester, Mass.

—o—

James W. Kinnear Jr. has been appointed executive vice president of the Firth Sterling Steel & Carbide Corp., McKeesport, Pa. He formerly had been assistant manager of operations of the Pittsburgh district of the Carnegie-Illinois Steel Corp., Pittsburgh, and was associated with that corporation since 1923. Mr. Kinnear has been closely associated with the Firth Sterling Steel & Carbide Corp. for many years, and has served as a director since 1932. His father was one of the founders of Firth in 1896, and had been vice president of the company at the time of his death in 1922.

—o—

Roy E. Greenwood has been appointed district sales manager for the New York and New England districts of the American Chain Division, American Chain & Cable Co. Inc., Bridgeport, Conn. He will have headquarters at New York. Mr. Greenwood has been with the company for 16 years, and for the past several years has been assistant manager for the Pacific Coast territories. Prior to that, he had been at the Bridgeport, Conn., Philadelphia and Chicago offices.

—o—

Adolph W. Engstrom, former president, Kenworth Motor Truck Corp., Seattle, and more recently works manager, International Harvester Co., Emeryville, Cal., has been appointed executive vice president and general manager of Western Metalcraft Inc., Olympia, Wash. Mr. Engstrom was one of the original incorporators of Kenworth, and from 1938 to 1945 had been associated with the late **Philip G. Johnson,** former president of Kenworth and of Boeing Aircraft Co., Seattle.

—o—

A. A. Nelson, assistant general sales manager, Keystone Steel & Wire Co., Peoria, Ill., has resigned after 41 years' association with the company. **William H. Getz** has been named manager, merchant sales, and will supervise the distribution of Keystone agricultural products throug jobber and dealer channels. He has bee associated with the company for 12 year and since 1936 has been district direct of industrial sales.

—o—

Paul I. Stevens has been appointe works manager of Consolidated Vulte Aircraft Corp. in the San Diego, Calif Division. He will supervise manufactu ing operations in connection with pr duction of 40-passenger, 300-mph Co vair-Liners and L-13 liaison planes. Fo the past 18 months Mr. Stevens has bee on the corporate staff of the company a a manufacturing assistant, handling ma ufacturing problems in Convair's five d visions, and at ACF-Brill Motors Co an associated Consolidated Vultee firm

—o—

Robert O'Brien has been appointe sales manager, Truck Division, and **F. Foot,** sales manager, Bus Division, Ken worth Motor Truck Corp., Seattle. M O'Brien has been with the company sinc 1943, and Mr. Foot formerly had bee with Everett Pacific Shipbuilding & Dr Dock Co.

—o—

George D. Fraunfelder, formerly chie sales engineer of Easton Car & Construc tion Co., Easton, Pa., has been appointe to the newly created office of director o engineering and research. He has bee with Easton as a design engineer sinc 1926.

—o—

Herbert W. McKeague has been ap pointed purchasing agent, and **Russe Todd,** assistant purchasing agent, for th Home Radio Division, Westinghous Electric Corp., Pittsburgh. Mr. McKeagu formerly had been assistant to the vic president in the Purchases & Traffic D vision at Pittsburgh.

—o—

Preston M. Postlethwaite has been ap pointed manager of both the Electric and Automotive Divisions of the Wagne Electric Corp. branch at Portland, Oreg This transfer follows his association wit the sales department of the Wagne branch at Pittsburgh. In his new pos tion, Mr. Postlethwaite will direct th operation of the Portland branch, an the distribution and merchandising Wagner automotive and electrical prod ucts in this territory.

—o—

John R. Gregory has been appointe Pacific Coast representative for ste plant sales of Blaw-Knox Co., Pittsburgh

—o—

Charles D. Elliott has become ass ciated with the Herbrand Division Bingham Stamping Co., Toledo, O.,

Tough cold-heading jobs come out clean
WITH THIS SPECIAL-ANALYSIS WIRE
Recessed head screws of all kinds are among the many difficult jobs that ARMCO Cold-Heading Wire takes in stride.
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Quick Delivery
Besides a trim, clean-cut appearance, ARMCO Cold-Heading Wire gives your products all the other advantages of stainless steel — great strength and exceptional resistance to corrosion, staining and high heat.
You can get quick delivery of ARMCO Cold-Heading Wire by writing or 'phoning The Rustless Iron & Steel Division, The American Rolling Mill Co., 3426 E. Chase St., Baltimore, Md.
THE RUSTLESS IRON & STEEL DIVISION
The American Rolling Mill Company
Rustless
DIVISION OF ARMCO

assistant to the manager. He had been with the Federal Electric Co., Chicago, and the Chefford Master Mfg. Co., Fairfield, Ill.

—o—

D. B. Karlskind has been appointed Pacific Coast sales manager of the wire and cable department of the United States Rubber Co., New York. He will have headquarters in San Francisco. Formerly he had been midwestern district engineer of the wire and cable department.

—o—

Elmore T. Scheck has been appointed to the Milwaukee sales force of the L. J. Mueller Furnace Co., Milwaukee. For the past 20 years he has headed the service, traffic and claims departments of the company.

—o—

Willard C. Gulick has been elected president of International B. F. Goodrich Co., Akron, succeeding **Stanley W.** Caywood, retired. Mr. Gulick previously had been general sales manager of the Export Division.

—o—

Henry C. Rudy, previously New Orleans branch manager of the Owens-Illinois Glass Co., Toledo, O., has been appointed manager of the company's Prescription-Ware Division.

—o—

F. A. McCarthy, vice president and sales manager of Forem Distributors Inc., Buffalo, has been appointed dealer for industrial research apparatus manufactured by North American Philips Co. Inc., New York. His territory will include 14 counties in western New York, and 7 counties in northwestern Pennsylvania.

—o—

W. O. Trownsell, chief metallurgist of the Wire Division, Continental Steel Corp., Kokomo, Ind., has been appointed chief of metallurgy and inspection for the company. He has been associated with Continental Steel since 1931.

—o—

H. S. Jakobsen, formerly partner of the J & S Tool Co., East Orange, N. J., has disposed of his interests in that concern, and is making plans regarding a new company that he is now forming.

—o—

A. M. Rochlen, for the past ten years director of industrial and public relations for the Douglas Aircraft Co., Santa Monica, Calif., and industrial relations advisor to eastern corporations, has been named a United States delegate to the International Labor Organization meeting in Stockholm, Sweden, Sept. 1.

—o—

Edwin J. Lewis has been appointed manager of petroleum company sales for the Replacement Tire Sales Division of

HAROLD A. HARTY

Advertising manager, Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co., Detroit, has been elected president of the Industrial Marketers of Detroit. Noted in Steel, July 28 issue, p. 66

the B. F. Goodrich Co., Akron. He succeeds **Howard F. Miller.** Mr. Lewis has been assistant to the manager of passenger car tire sales.

—o—

Jerome B. Strauss has been named manager of the offices and warehouses in Houston, Texas, recently opened by the L. B. Foster Co., Carnegie, Pa.

—o—

D. S. Walker, vice president of Combustion Engineering Co., New York, has been elected president of the U. S. Naval Academy Alumni Association.

—o—

Lt. Col. Douglas H. Hatfield has been appointed resident representative at the Boeing Aircraft Co., Seattle, for the Air Material Command of the Army Air Forces.

—o—

Thomas J. Garrison Jr. has been placed in charge of the eastern Michigan territory for the Air Tool Division of Aro Equipment Corp., Bryan, O. The company also named **Joseph Donlan** as assistant to **E. J. Somerville,** in the Chicago territory. **Edward Messervey,** formerly salesman in the Detroit Aro branch on automotive air tools, has been transferred to the Factory Sales Division in Bryan, O.

—o—

Federal Products Corp., Providence, R. I., which has moved its Detroit office from the Boulevard Bldg., Woodward Ave., to its own building at 17181 Schaefer Highway, Detroit 21, announces that **Andrew M. Grant** remains as manager of the office, and that **A. R. Supol** has joined the Detroit sales force, succeeding **Ralph H. Chapman,** who was recently appointed manager of the company's Los Angeles branch office.

—o—

A. R. Kelso has been appointed ex-

FRANK B. POWERS

Assistant to vice president-operations, Eddystone Division, Baldwin Locomotive Works, Eddystone, Pa., given responsibility for all engineering activities of the division. Noted in Steel, July 28 issue, p. 66

ecutive vice president of the Warren City Mfg. Co., and the Warren Stamping Co., both of which are subsidiaries of the Federal Machine & Welder Co., Warren, O. He joined Warren City Mfg. Co. from the Rock-Ola Mfg. Co., Chicago, where he served as executive vice president for the previous three and a half years. Prior to his connection with Rock-Ola, Mr. Kelso had been assistant general manager of the United States Cartridge Co., division of Western Cartridge Co., St. Louis.

—o—

Dr. Gordon M. Butler has resigned as associate director of research in the Tool & Die Steel Division of Allegheny Ludlum Steel Corp., at Dunkirk, N. Y.

—o—

Charles E. Nelson Jr. has been appointed to the newly created position of assistant to the president of the Waukesha Motor Co., Waukesha, Wis. He has been director of purchases and production planning, and will continue these duties in addition to his new position.

—o—

To correlate the sales activities of the Columbia Chemical Division of Pittsburgh Plate Glass Co., Pittsburgh, and the Southern Alkali Corp., company subsidiary, **W. L. Galliher** has been appointed executive sales manager of both units. Associated with Columbia Chemical since 1931, Mr. Galliher had been director of sales for the division's heavy industrial chemical products for 12 years, and has served as Columbia's executive sales manager since 1943. As executive sales manager for both Columbia Chemical Division and Southern Alkali Corp., he will maintain headquarters in Pittsburgh.

—o—

Paul G. Lutz, vice president and gen-

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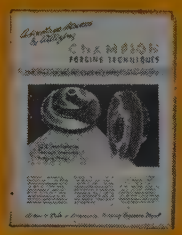

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DROP AND UPSET FORGINGS, CARBON AND ALLOY STEELS • HEAT TREATING • LABORATORY AND QUALITY CONTROL

eral manager, Standard Alloy Co. Inc., Cleveland, has been elected president of the Alloy Casting Institute. Other officers elected are: **W. B. Sullivan,** Lebanon Steel Foundry Co., Lebanon, Pa., vice president; and **E. A. Schoefer,** Alloy Casting Institute, executive secretary and treasurer. **H. A. Cooper,** president, the Cooper Alloy Foundry Co., Hillside, N. J., and **J. D. Corfield, vice** president, Michigan Steel Castings Co., Detroit, have been elected to the board of directors of the organization for three year terms. **H. S. Avery,** research metallurgist, American Brake Shoe Co., New York, has been elected chairman of the Technical Research Committee.

—o—

Secretary of State George C. Marshall has been elected to honorary membership in the American Society of Mechanical Engineers. Three others named to receive honorary memberships are: **Dr. Harvey N. Davis,** president of Stevens Institute of Technology; **Francis Hodgkinson,** retired consulting engineer, Westinghouse Electric Corp., Pittsburgh; and **Everett G. Ackart,** retired chief engineer, E. I. du Pont de Nemours & Co., Wilmington, Del.

—o—

George H. Bell has been elected vice president in charge of distribution by Graham-Paige Motors Corp., Detroit. He has been with Willys-Overland Motors in Toledo, O., for the last eight years.

—o—

J. DeWitt Titman has resigned as public relations director of Ansco Division, General Aniline & Film Corp., Binghamton, N. Y., to become vice president and general manager of the newly organized Ludlow Temperature Control Corp., Binghamton.

—o—

The 60th anniversary of his entrance into the chain industry recently was celebrated by **Eli Round,** fire weld superintendent and member of the board of directors of the Cleveland Chain & Mfg. Co., Cleveland.

—o—

H. William Krantz Jr. and **Edmund G. Siess Jr.** have formed the Industrial Products Sales Co., Akron. Mr. Krantz formerly had been with the American Steel & Wire Co., Cleveland, in the Market Development Division, and Mr. Siess has been connected with A. Schroeder & Sons, Cleveland.

—o—

Donald W. Frease, operating vice president of the Reeves Steel & Mfg. Co., Dover, O., has been elected president of the Empire Steel Corp., Mansfield, O., and a member of the board. He will retain his executive position with Reeves, and will maintain his residence at Dover. Mr. Frease succeeds **Joseph R. Montgomery,** who resigned as president of Empire in June. **James M. Hill** has been named chairman of the Empire company. He formerly had been president and chairman of Empire, but several years ago retired to an advisory post.

BERTON H. DeLONG
Appointed vice president and technical director, Carpenter Steel Co., Reading, Pa. Noted in Steel, July 21 issue, p. 90

—o—

Paul Persons has been elected president of the Engineers Council at Alabama Polytechnic Institute, which is composed of 13 engineering societies.

—o—

The promotion of three engineers in the Aircraft Gas Turbine Engineering Division, at Lynn, Mass., General Electric Co., includes: **Claude H. Auger,** who has been placed in charge of production engineering on both aircraft and gas turbines and turbo-superchargers; **Joseph S. Alford,** who has been placed in charge of development engineering for aircraft gas turbines; and **Richard C. Robin,** placed in charge of engineering general services.

—o—

Alvin H. Hartman has been named New York area sales representative for the Vacuum Equipment Division, Distillation Products Inc., Rochester, N. Y.

—o—

Ralph D. Au, formerly with the office of rubber inspection in New York, B. F. Goodrich Co., Akron, has been named manager of the company's rubber purchasing department.

—o—

The Kaiser-Frazer Corp., Willow Run, Mich., has announced the appointment of **T. A. Bedford** as general manager of the Detroit plant, and the completion of the temporary assignment of **E. J. Hunt** as production manager of the Kaiser-Frazer Detroit Engine Division, and his transfer back to the Willow Run plant to head a special expansion program.

—o—

Donald C. Riley has been appointed assistant to the president of Magna Mfg. Co. Inc., New York. He formerly had been head of the chemical engineering branch of the joint Army-Navy Medical Supply Service.

—o—

W. Walter Young has been named controller of Redmond Co. Inc., New York and Owosso, Mich. He formerly had been with Harry B. Culley & Co., Pittsburgh.

—o—

Joseph A. Warren has been elected a director and vice president of the Trimble Co., Pittsburgh. He formerly had been connected with the Bell Telephone Co. of Pennsylvania, and the War Production Board at Washington. **William H. McMinn** has been elected vice president of Trimble, in addition to his duties as secretary of the company. He has been associated with the company for 15 years.

—o—

James B. Porteous, formerly with the Westinghouse Electric International Co., Pittsburgh, as regional director in charge of distribution in Brazil, has been elected president, a director and chief executive officer of the Sterling Engine Co., Buffalo. He succeeds **Addison F. Vars,** who has been elected chairman. **George M. Ebert,** formerly vice president and comptroller of Sterling, has been elected executive vice president and comptroller. **Frank G. Raichle** has been re-elected secretary of the company.

—o—

Desmond Gamble has been appointed sales representative of McNally-Pittsburg Foundries Inc., Pittsburg, Kans. He takes charge of all territory in the western half of the country. Mr. Gamble formerly had been office manager of the company, which is a subsidiary of McNally Pittsburg Mfg. Corp.

—o—

W. D. McElroy has been appointed manager of the development department of the Research & Development Division, at Library, Pa., Pittsburgh Consolidation Coal Co. He will be in charge of all pilot plant operations in the company's program of coal gasification.

—o—

Col. Frank H. Higgins has been elected vice president of Hupp Corp., Detroit. He will head the company's Detroit operations. Colonel Higgins was, for many years, an executive with Willys-Overland Co., Toledo, O. Since the end of the war he has been presi-

DR. R. C. GIBSON
Has been promoted to technical director of the Parker Rust Proof Co., Detroit. Noted in Steel, July 28 issue, p. 70

RICHARD M. PAXTON Jr.
Has been elected a vice president of Jessop Steel Co., Washington, Pa. Noted in Steel, July 21 issue, p.95

G. J. ZIMMERMAN
Appointed sales manager of General Steel Warehouse Co. Inc., Chicago. Noted in Steel, July 28 issue, p. 71

dent of the Fostoria Screw Co., Fostoria, O., which position he recently resigned to become associated with Hupp.

—o—

Howard H. Loving has been appointed factory representative in the Chicago district for the Adalet Mfg. Co., Cleveland. He has been connected with the Steel & Tube Division, Republic Steel Corp., Cleveland, with which he had 11 years' service, supervising and promoting the sale of light wall conduit.

—o—

S. J. Moran has been promoted to works manager of the Union Steel Castings Division, Blaw-Knox Co., Pittsburgh, and **J. L. Daugherty** has been appointed to succeed him in the position of assistant treasurer and production manager of the division.

—o—

Richard J. Goodwin has been appointed assistant supervisor, invoice accounting, American Works, American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp. **Charles H. Bier** has been appointed assistant supervisor, fine wire accounting, and **Raymond A. Kritzel** has been appointed assistant supervisor, coarse wire accounting, at the American Works. **Frederick F. Head** has joined the American Steel & Wire Co. as central furnaces and docks accounting supervisor, and **Raymond Raquet** has been made assistant supervisor, invoice accounting, of the Cuyahoga Works. **John P. Saul** has been made assistant supervisor, wire drawing accounting, Cuyahoga Works. **Frank D. Evans** has been appointed assistant district purchasing agent, Cyclone Fence Division, at Waukegan, Wis.

OBITUARIES . . .

James E. Woodard, 64, treasurer of the Anaconda Copper Mining Co., New York, died recently.

—o—

Malcolm G. Campbell, 74, former president and chairman of the board of the Kelsey Wheel Co. Ltd., Windsor, Ont., died July 23.

—o—

J. H. Schnibbe, service engineer, Cincinnati branch, Crucible Steel Co. of America, New York, died recently at Syracuse, N. Y., after a long illness. He had been associated with Crucible for over 38 years, and had previously been a salesman at the Cleveland branch for 20 years.

—o—

Arthur E. English, 82, one of the founders and director of the United States Gypsum Co., Chicago, died July 22 in Beverley Hills, Calif., where he had lived for 20 years.

—o—

J. Paul Arens, 57, works manager for Ceco Steel Products Corp., Chicago, died at his home, Oak Park, Ill., July 29, following a heart attack. He had been associated with the Truscon Steel Co., Youngstown, for many years before becoming associated with Ceco as works manager in 1937.

—o—

George S. Appelgate, 45, chief of engineering of the Westrex Corp., subsidiary of the Western Electric Co. Inc., New York, died recently. He had been with the Western Electric Co. since 1928.

—o—

David A. Patton, 55, plant manager of the Martin Dennis Co., Newark, N. J., died July 27.

—o—

Robert E. Rutledge, 48, superintendent of open-hearth furnaces at the Fairfield operations of Tennessee Coal, Iron & Railroad Co., subsidiary of U. S. Steel Corp., died July 26. He had been employed by TCI for more than 20 years.

—o—

Frank Petrasek, 49, vice president of the Slinger Foundry Co., Slinger, Wis., was killed in an automobile collision July 20.

—o—

James Crane Sr., iron foundry superintendent of Klotz Machine Co., Sandusky, O., died at his home July 27.

—o—

William B. Todd, 63, traffic agent for the Semet-Solvay Co., Cleveland, died July 29, after a heart attack. He had been connected with the company nearly a quarter-century. He came to Cleveland five years ago, previously serving in the Buffalo and Detroit offices.

—o—

Frederick F. Rose, 71, retired assistant vice president of the American Car & Foundry Co., New York, died July 26. He had been with the sales department of the company for 46 years.

—o—

J. F. Stone, 92, chairman of the board of the Seagrave Corp., Columbus, O., died July 25 at his home in Santa Monica, Calif. He had been president of the Ohio State Research Foundation, and chairman emeritus of Ohio State University's board of trustees.

—o—

Peter B. Hunter, 59, superintendent of the iron foundry of the New York Air Brake Co., Watertown, N. Y., died July 22 after a brief illness.

—o—

Frederick O. Schramm, 56, former general sales manager for the Pressed Steel Car Co. Inc., New York, died recently. He had retired in 1933 after 25 years' association with the company.

Gas Fluxing

In Production of Secondary Aluminum

By G. W. BIRDSALL
Reynol's Metals Co.
Louisville

DURING the past 5 or 6 years, every possible source of aluminum was pursued relentlessly to meet the greatly expanding needs for it. In fact, Reynolds Metals Louisville plant 5 reclaimed more than 5 million pounds of aluminum monthly during this period. This was quality metal because it had to meet the rigid requirements for aircraft.

From the start, the company's secondary aluminum program was based on the idea that properly remelted and refined scrap could be made into good sheet that would meet aircraft requirements. With the quality standards thus set high, the plant started using only a small amount (about 20 per cent) of scrap, mixing it with virgin aluminum. Within 8 months, charges were made up of 100 per cent scrap, with resulting metal meeting the original impurity limits of the sheet from which the scrap originated. Some 100 cars of aircraft scrap were handled monthly.

Improved fluxing through the development of continuous introduction of gaseous chlorine into the molten bath of remelted aluminum is regarded by Norman Kohlhepp, plant manager, and his assistants, C. W. Briel, J. E. Bramblette and R. Van Winkle, as one of the most important factors contributing to this achievement. That

This first section of the two-part series discusses improved melting and refining practices in handling wide variety of aircraft body scrap with remarkably efficient recovery. Continuous gas fluxing with chlorine, combined with innovations in furnace practice, permit economical production of high grade aluminum alloys that meet original impurity limitations of 17S or 24S

it is an achievement is evident from a comparison of the analysis of Navy reclaimed ingot, Table I, with typical cast analyses at plant 5, shown in Table II.

Metal with the low impurity limits indicated in Table II does not need to have virgin aluminum added to make it usable. So successful is the remelting and refining practice that reclaimed metal can easily be remelted and brought to definite desired composition ranges such as those for 17S or 24S simply by the addition of alloying elements. Good metal for foundry, rolling mill or forge shop can thus be had without "sweetening" with virgin aluminum.

(*Please turn to Page* 115)

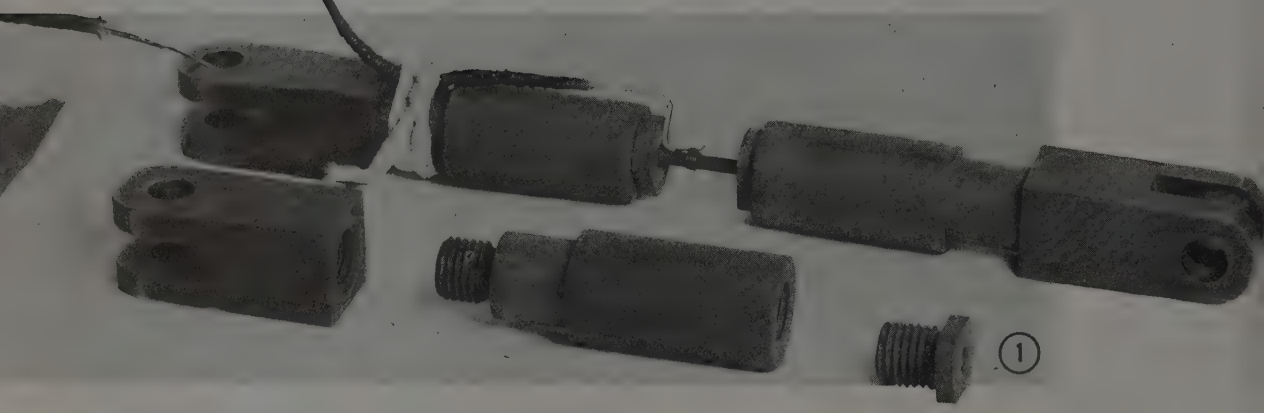
Fig. 1—Developed at the request of Reynolds materials handling engineers, the special fork head shown in use here has since seen wide acceptance in other plants with similar bulk handling operations

Fig. 2—Dross or oxidized aluminum and other impurities are scraped or raked off the top of the bath into a special two-wheeled dross buggy

Fig. 3—Airplane engines are held and lifted off supports by crane. Plane is towed to salvaging area, oil and gas drained, gas tanks filled with water, lines flushed out, then dynamited as a safety measure

Fig. 4—Charging furnaces mechanically, direct from gondola cars is possible because segregation and cutting are eliminated

Comparatively new method designed to make tests at 1500° F, employing six furnaces during its operation, may be used in any plant where high temperature testing is required. With it, one operator can easily average 35 tests per shift—including setup and recording of data



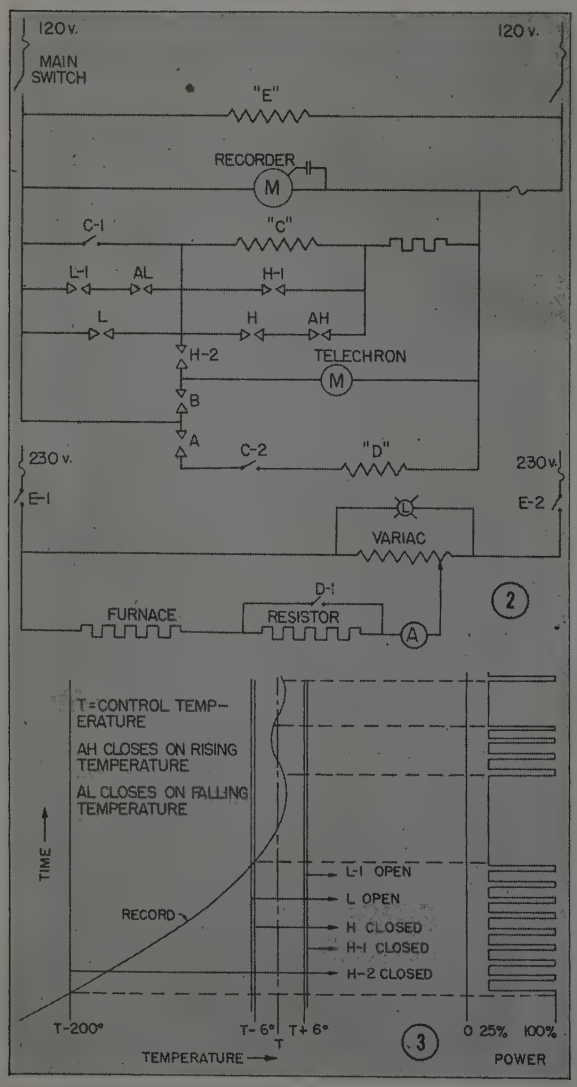


Fig. 1—Specimen assembled for setup and exploded view of specimen holder
Fig. 2—Wiring diagram for control equipment
Fig. 3—Contact settings and typical control record
Fig. 4—Temperature record for one unit. Six of these recording units complete the panel for one testing machine

IN THE modern turbosupercharger or gas turbine, the turbine wheel and buckets are exposed directly to the hot gases from which the driving power for the unit is derived.

Maximum operating temperature of these parts may exceed 1500°F, while at the same time being subjected to the stresses which are produced by the high rotational speed of the turbine wheel and possible vibration of the turbine blades. It is well known that the tensile strength of materials decreases as the temperature increases, but the degree to which this loss of strength is experienced is a function of the composition of the material as well as the heat treatment or cold work to which the material has been subjected. It is obvious, therefore, that the only method by which the engineer can properly design the turbine wheel and buckets using present materials, or evaluate new materials for this application, is to know the strength of the material at the operating temperatures encountered.

During the early development of the turbosupercharger, the amount of testing was small and no special emphasis was placed on the mass testing of materials. The equipment used consisted of a single furnace with suitable temperature controls and a testing machine with suitable specimen holders. Using this equipment it was possible to test only three or four specimens in the course of an 8-hour shift, but this was sufficient for the needs. The major result of this preliminary work was the development of a furnace with a distributed winding which gave uniform temperature along the test specimen within about 10°F. This furnace was used without change except for

By A. W. BRUNOT
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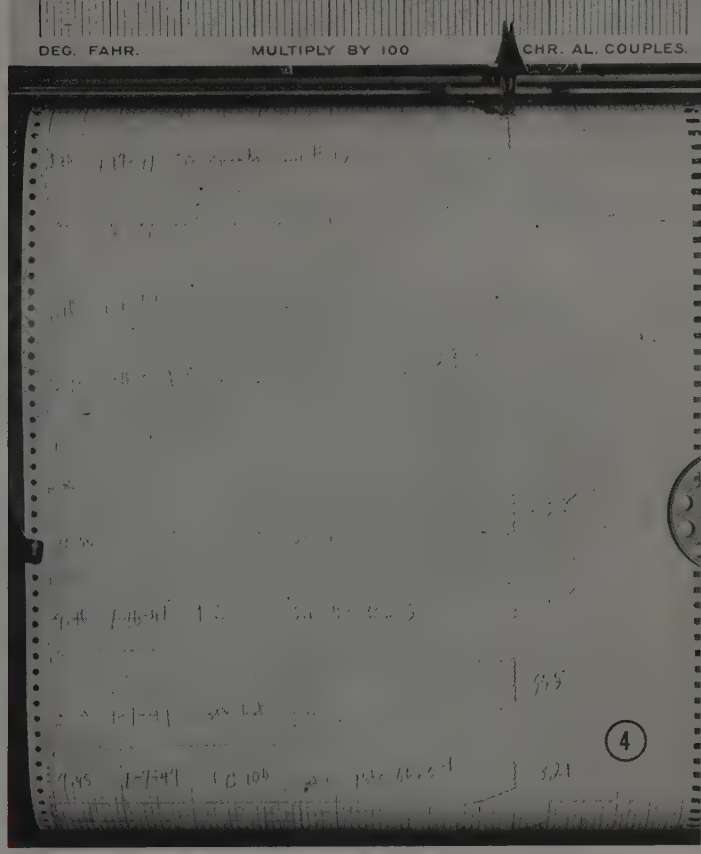
General Electric Co.
Lynn, Mass.

Tensile Testing

AT ELEVATED TEMPERATURES



the external construction in all future testing up to 1800°F.

By the time that limited production of turbosuperchargers was started, the testing procedure was improved to the extent that the time which the test specimen was held at testing temperature before test was reduced so that six tests could be conducted in a shift. This method of testing was continued until the war caused a sudden rise in production and some faster method of testing was required or a marked increase in personnel, equipment and space would be needed. In order to see the advantages of the new system finally developed, however, it is first necessary to understand the older method.

As previously mentioned, the tests were made on a single testing machine equipped with a single furnace supported from a bracket on one column of the testing machine. Two long specimen holders were fitted to the standard grips of the tensile tester. These holders were long enough to extend through the furnace to permit the assembly of the specimen for test. In order to set up the specimen, the holder attached to the upper cross-head of the testing machine was inserted in the furnace and the furnace raised, so as to expose lower end of upper holder.

Test specimen, which had previously had a thermocouple tied to it at the center of the test length, was inserted in the two specimen holders and the furnace was lowered so as to place the test bar at the center of the furnace. The top and bottom of the furnace were then closed with asbestos paper, which was tied in place with asbestos tape so as to minimize convection through the furnace, which would destroy the uniform temperature condition. The specimen was now ready for heating to test temperature.

Two temperature instruments were required to control the temperature of the test specimen. The thermocouple which was tied on the specimen was taken to a temperature recorder to give a record of the test temperature for future reference. A second thermocouple was inserted in the core of the furnace and was connected to an indicating-controller.

The operator first set the controller to about 200° F above the desired test temperature and turned on the furnace. The controller prevented the core of the furnace from overheating and burning out the winding.

As the temperature of the specimen approached the desired test temperature, the controller was cut back and periodic adjustments made to cause the temperature of the test specimen to reach and remain at the desired test temperature. While this appears to be a simple procedure, considerable difficulty was encountered due to the fact that successive tests at the same temperature generally did not require the same setting of the controller in order to maintain the test temperature.

In some cases the change was about 200° F, and this was further complicated by the fact that at times the indicated core temperature was below the test temperature, while at other times it was above, as should be expected. This variation in the apparent core temperature was due primarily to shifting of the core thermocouple as the furnace was moved (*Please turn to Page* 110)

CUTTING OFF . . .

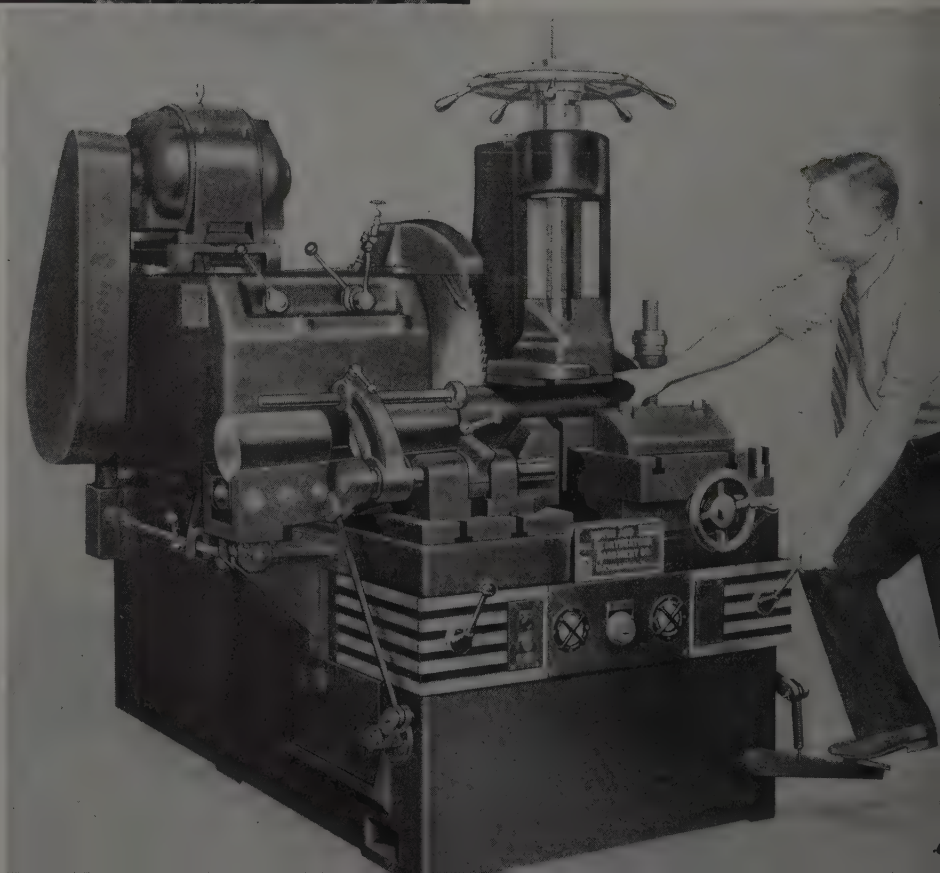
Part Nine of a Series, and the Story of Those Machines which, After Many Years of Treatment Like "Step-Children" in the Metalworking Machinery Family, Have Had Cinderella-like Promotion into the Aristocracy of

MODERN MACHINE TOOL

By GUY HUBBARD
Machine Tool Editor, Steel

Above — Illustrating the trend toward automaticity in production cutting-off operations, this high speed production milling machine is tooled up for multiple cutting of precision disks from bar stock by repetitive hydraulic cycle. Photo courtesy U. S. Tool Co. Inc.

Right—High power cutting-off machine of circular saw type, with built-in hydraulic feed. This production machine has treadle-operated stock-stop and roller conveyor for carrying away the cut sections. Saw carriage automatically returns to starting position at termination of each cut. Photo courtesy Motch & Merryweather Machinery Co.



UNTIL recently, the most abused and neglected "step-children" in the machine tool family were the cutting-off machines. Tucked away in some dark corner of a basement where bar stock and tubing was stored, the typical power saw as I recollect it in all too many shops of less than 20 years ago, patiently "clunked" away the hours, weeks, months and years—with no more attention than naturally could be expected from a superannuated individual who tended the saw at intervals between some of the less desirable sweeping jobs and periods of contemplative tobacco chewing.

The benefactor who eventually initiated the movement which led to the rescue of these machine tool Cinderellas from such places of bondage as I have just described, was that manufacturer who first built a power-driven cutting-off machine of machine tool quality which really looked the part. Who he was I do not know. What I do know is that he set a pattern which quickly was adopted by all important makers of these important machines.

Today they are recognized as members of good standing in the machine tool industry. Today their machines are listed among high production, accurate metal-cutting machines. Today these machines stand proudly in production lines along with lathes, milling machines, gear cutting machines and all the others. Those which do happen to be assigned to the bar stock department now are properly located, properly operated and properly serviced.

The success story of the modern cutting-off machine presents one of the strongest proofs of what good appearance can do for machine tools—provided, of course, that "what looks right, is right" as most certainly is true of these machines. I have observed that agricultural machinery of early General Grant design is much more apt to be left standing in the fields all winter than are implements of the snappy designs now in vogue among the farm machinery people. There may be a parallel there.

When we think of cutting-off machines we are apt to think first and foremost of power hack saws. It is true that they were the earliest. They undoubtedly still are the most numerous. Of all types they were the most abused. In the process of development they have been so greatly improved that today—except for their name—they bear little or no resemblance to the "hand hack saw driven by a crank and connecting rod" from which they descended.

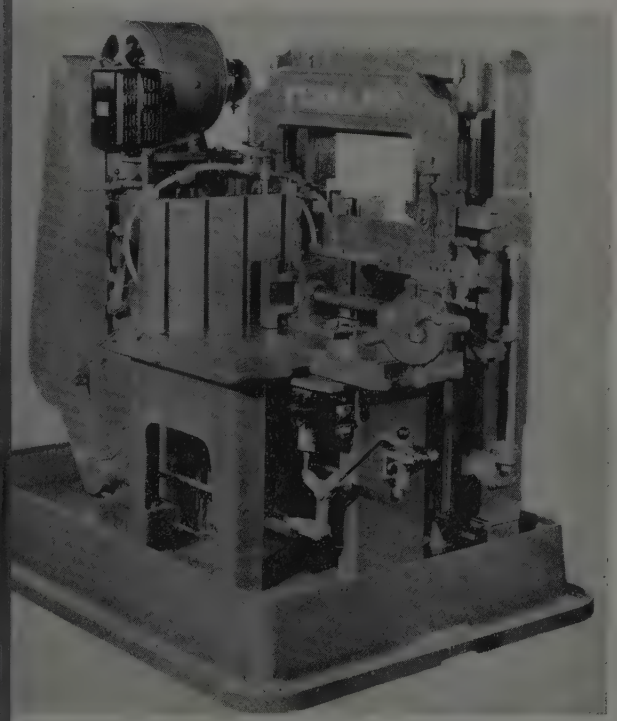
I don't like that name "power hack saw" as applied to these machines of modern vintage. In fact, I don't like the name "hack saw" in any connection with modern machine shop practice. It gives the idea of a rough operation—hacking off metal—something not far removed from the nicking and sledging off of bar stock which was practiced in old-time forge shops. Modern power hack saws actually are smooth performers which cut metal at high speed (with scientifically designed high speed steel blades as carefully engineered as broaches) and cut it to close specifications.

The illustration at the bottom of this page shows one heavy duty power hack saw of modern design capable of handling material up to 14 in. square. This machine has hydraulic feed, cutting speed which gets the benefit out of high speed steel blades, automatic lift on return stroke —which is at high speed to minimize nonproductive time, quick acting vise and provisions for automatic stock feed, accurate angular adjustment, and convenient controls. In other words it is "a machine tool through-and-through" in the best sense of that term. Such a machine as this inspires its operator with a sense of responsibility.

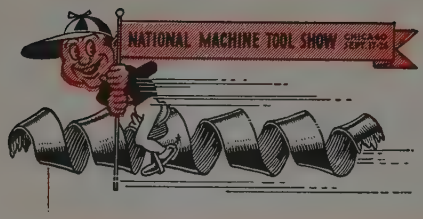
With those few and highly deserved good words for the modern descendant of the power hack saw, let us take a quick look at the whole field of cutting-off as it stands today. Counting the type of machine just mentioned, there are at least 15 types of cutting off machines. Here are some of them: Conventional speed band saws, superspeed band saws, conventional speed circular saws, superspeed circular saws, abrasive disk machines, work-revolving blade cut-off machines, tool revolving blade cut-off machines and machines which cut off by means of incising disk cutters.

One of the most interesting and rapidly growing of these family groups is that comprising the various types of band saws. Band saws were dreamed of by inventors long before metallurgists and saw blade manufacturers made them possible. They actually did come into rather common use on woodworking about 100 years ago. One of the earliest practical machines of which I have been able to discover a convincing case history was the "Belt Sawing Machine" invented by Lemuel Hedge and publicly demonstrated in the car shop of the Robbins & Lawrence Co., Windsor, Vermont (forerunner of the Jones & Lamson Machine Co.) in August, 1849.

In the rather flowery language of that era, the *Vermont Journal* reported: "Its remarkable simplicity and adaption to all possible purposes ever effected by saws cannot fail to command the attention of mechanics. It is capable of sawing on straight lines or on curves of any radius down to ¼-in. Its natural adjustment ensures its working at



Left—Hydraulic feed reciprocating saw with cutting capacity up to 14 x 14 in. Heavy machine tools such as this have lost practically all earmarks of their now remote "hack saw ancestry". Photo courtesy Peerless Machine Co.



Whoever invented the term "hack saw" perpetrated an ideological crime against a metal-working process which always was far removed from "hacking" and deserves a better name.

After serving many years in dungeons of machine shops, cutting-off machines of at least 14 varieties finally have won a place-in-the-sun.

A preliminary survey of these machines, which are to be exhibited at the Machine Tool Show, Dodge-Chicago plant, September 17-26, 1947, indicate that they will constitute one of the great "eye-openers" of that great show.

exactly right angles from any surface of the material, but it is easily adaptable to saw through at any desired angle, whether the line in which the saw progresses be straight or curved. It is also capable of sawing tortuous or winding surfaces".

All this sounds strangely prophetic of what my friend Leighton Wilkie of Des Plaines, Ill. has been accomplishing within recent years with metalcutting "contour sawing machines" of the design illustrated on this very page of this article. Machines of this type—both conventional speed and superspeed—have been developed so far beyond ordinary cutting off operations, that to all intents and purposes they represent a distinct class of machine tools involving a distinct technique in machine shop practice. I easily could devote this entire article to contour sawing, but inasmuch as Leighton Wilkie already has written a book on the subject, I recommend that book.

While on this subject of metalcutting band saws it should be mentioned that machines of that type have moved over strongly from the woodworking industry to take their place among the recognized production machine tools—their main attraction originally being that their continuous travel in one direction eliminated time-loss due to noncutting back stroke. These machines are built both in vertical type and also in ingenious tilted designs more nearly resembling the reciprocating saws.

An interesting wartime "discovery"—closely paralleling that of superspeed milling, was the high speed cutting of ferrous and nonferrous metals on woodworking band saws speeded up as high as 12,000 ft per minute. It was found that ordinary carbon steel woodworking blades could be used, the metal in the kerf literally being "vaporized". Apparently cutting is by frictional heat, although neither work nor blade get hot. Machines now are being built especially for this kind of sawing. If you are interested, consult the specialists. It is a dangerous field for amateur experimentation. However, I have seen practical demonstrations, so I know that it has possibilities.

Circular saws are still another type which have moved over from the woodworking industry into metalworking. However, in the process of evolution, the modern circular saw cutting off machine has become much more closely related to heavy duty milling machines than to any woodworking machines, and its blades are much more like narrow milling cutters than like woodworking circular saws. All this is evident from the illustration at the lower right of the first page of this article. This shows a Motch & Merryweather hydraulic feed cold sawing machine with foot treadle-operated stock stop and roller conveyor.

Machines of this type are rugged and powerful machine tools capable of cutting work such as gear blanks to such accuracy and finish that only a light going over on a surface grinder is required for finishing. They have multispeed geared heads like those of milling machines and can be rigged for automatic feeding and conveyorizing in production lines. The blades, which have teeth in sections, are designed along scientific lines and have gullets between the teeth shaped to curl the chips as broach teeth do. Hydraulics are applied both to feeding the saw and clamping the work—with notable success.

Just as band saws are built both in conventional and superspeed types, so also are circular metalcutting saws. Experiments conducted many years ago proved that it is possible to cut metal by means of high speed metal disks. Originally this "burning off" by friction was confined to comparatively rough operations in steel mills, etc. Lately, however, some of the makers of fine woodworking machines have brought out redesigned models for metalcutting by toothed disks.

These are capable of cutting shapes and sections at speeds formerly associated with cutting up kindling wood. These machines find wide use on metal sash and trim—both straight and angle cutting. This ties in neatly with welded fabrication, allowing cutting to keep pace with rapid welding methods. All this goes to prove that woodworking and metalworking, in many instances are growing closer and closer together as speeds and feeds increase on metal.

In more or less the same category with the high speed metal disk cutoff machines, are the abrasive disk ma-

(*Please turn to Page* 128)

Contour sawing machine of bandsaw type, which has outgrown the field of cutting-off and is responsible for a wide variety of shape-machining constituting a distinct phase of machining. Photo courtesy DoAll Co.

By ROBERT MAWSON

INDEXING DRILL JIG

. . . simplifies machining of electrical housings

SEVERAL interesting features are incorporated in a drill jig designed to machine holes in two electrical housings shown in Fig. 1. Jig is made of a 90-degree angular casting and a locating member which has a circular flange to register in the 5⅛-in. machined recess in the housing.

First machining operations are facing to length, machining the recess and turning outside diameter. Two holes are machined in each style of housing, A and B, Fig. 1, one ⅜-in. in diameter through the wall and a second hole ¼-in. diameter for a depth of ¼-in. Positions for these holes are shown in Fig. 1.

In front and attached to the circular flange on the drill jig are two rectangular lugs, D, Fig. 2, which sit in the cored slots of the housing. On the outer face of the flange is a larger flange, E, which is turned to be a good running fit in the machined recess in the vertical wall of the jig body.

A stud, F, threaded at each end, is attached in the locating member and provided with a nut at each end. These nuts are machined with notches on their diameter so that the operator can tighten or loosen by hand. At the rear of the jig is a machined steel plate, G, which can turn on the stud F and fits into a machined recess of the jig body. Drill guide bushings are located in their proper positions in the jig plate H which is held securely to the vertical wall of the jig body.

An index pointer, J, is attached to the face of the jig vertical wall at a location 20 degrees from horizontal position of the housing. In the same angular position an index line and letter A are marked on the face of the flange E; 40 degrees from this index line a second index line and the letter B are indicated. This angle then coincides with the angle shown on the detail drawing of the two housings, Fig. 1.

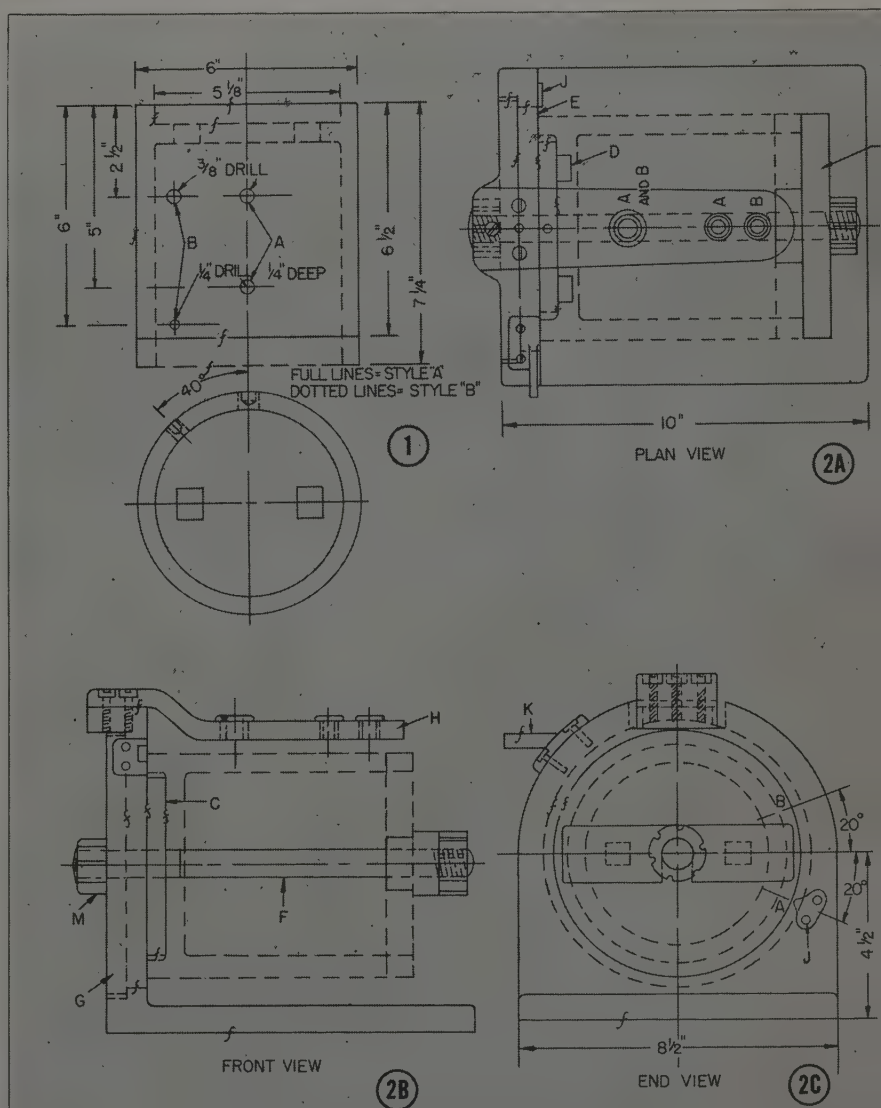
Referring to the detail of the housings it will be noticed that the ¼-in. holes are to be drilled for a depth of only ¼-in. For the purpose of setting the drill to machine this depth the jig is provided with a setting gage K which is used as will be described later.

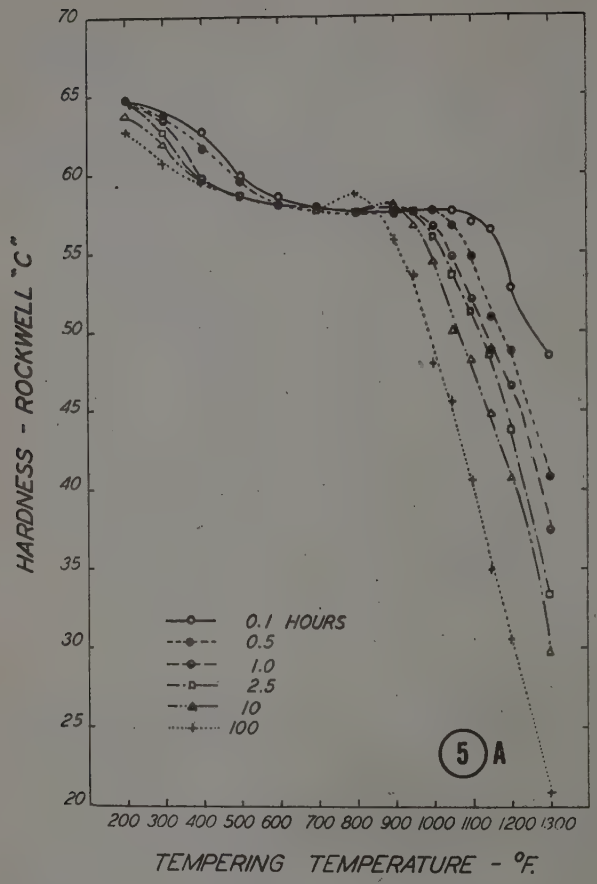
First spindle of a two-spindle drill press carries the ⅜-in. drill and is set so that it will pass through the wall of the housings. To set the ¼-in. drill, which is held in the second spindle, it is fed down onto the upper face of the gage. Stop collar on the spindle is then fastened in this position. When drill is fed into the housing proper, depth will be obtained by reason of the stop collar and setting method described.

To use the jig, housing is placed on the locating flange, C, and clamp, L, is slid over the stud. Nut on the stud is then tightened to hold the housing securely in the jig body. When machining the style A or shorter housing, the clamp is located with the shoulder away from the face of the piece, but on the longer housing the clamp is placed as shown in the illustration.

Operator can now revolve the housing; as this is in contact with the locating member, by reason of the projections, D, this motion also rotates the locating member. Motion is continued until index line coincides with pointer for the particular housing to be machined. When housing is in correct position, operator tightens nut M and as the pressure forces back plate G onto the vertical wall of the drill jig body the locating member and housing are held securely in position.

Holes are then drilled in the housing, drills being guided through the bushings in plate H, ⅜-in. through the wall and the ¼-in. to the proper depth as determined by the drill setting gage. Outer nut on the stud is then released and machined housing can be removed from the jig. If the same style of housing is again to be machined the jig is already set for the operation.





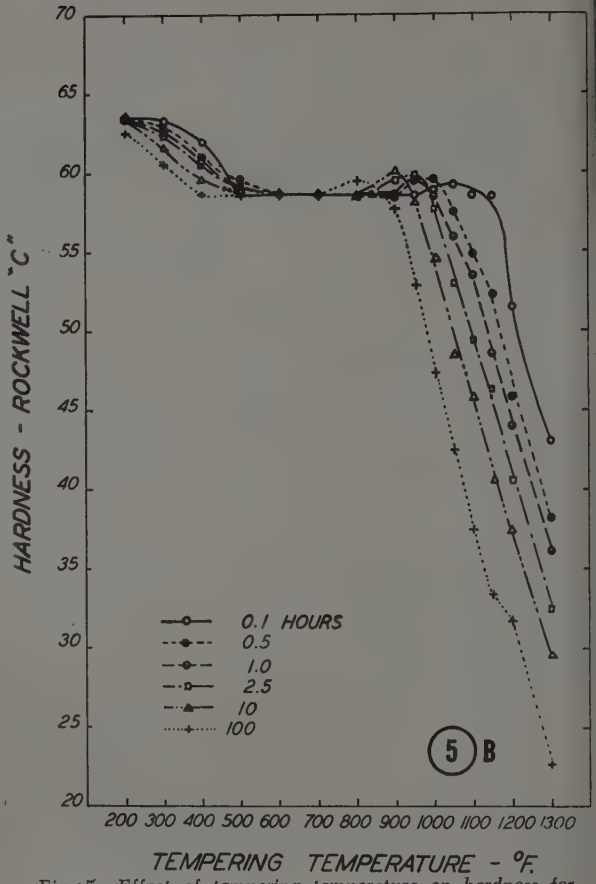
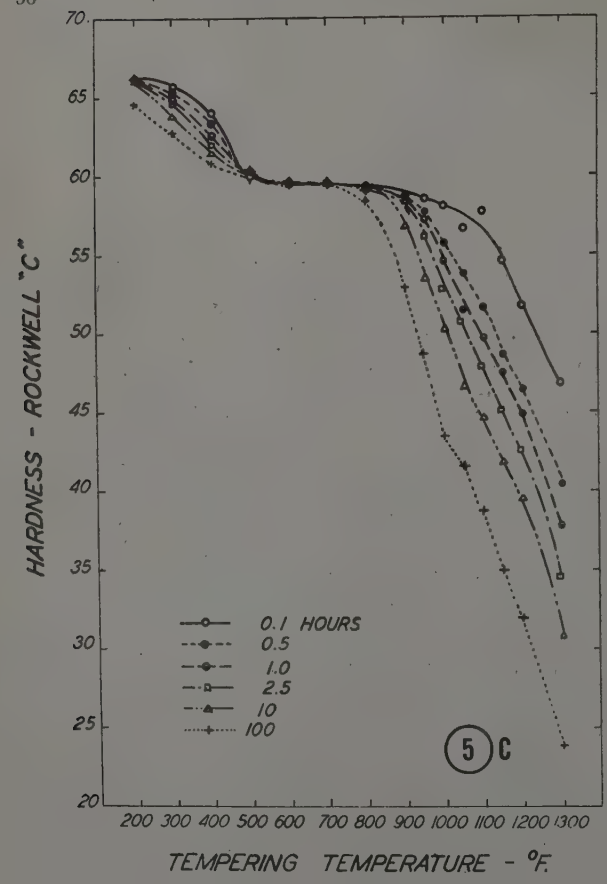


Fig. 5—Effect of tempering temperature on hardness for six tempering times. (a) Steel A quenched from 1775°; (b) steel O quenched from 1850° F; (c) steel C quenched from 1825° F; (d) steel P quenched from 2150° F; (e) steel F quenched from 2150° F



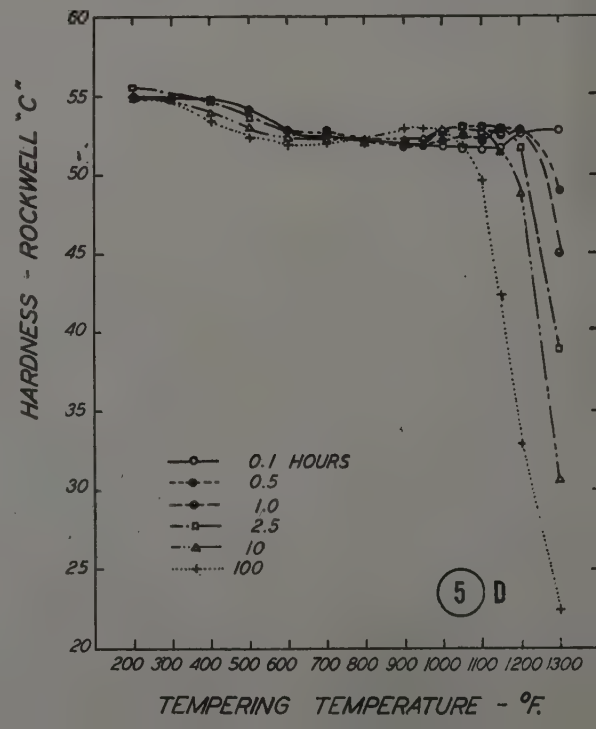


Fig. 6—Effect of hardening temperature upon quenched hardness of eight high alloy tool steels

By GEORGE A. ROBERTS
Chief Metallurgist
Vanadium Alloys Steel Co.
Pittsburgh

TEMPERING TOOL STEELS

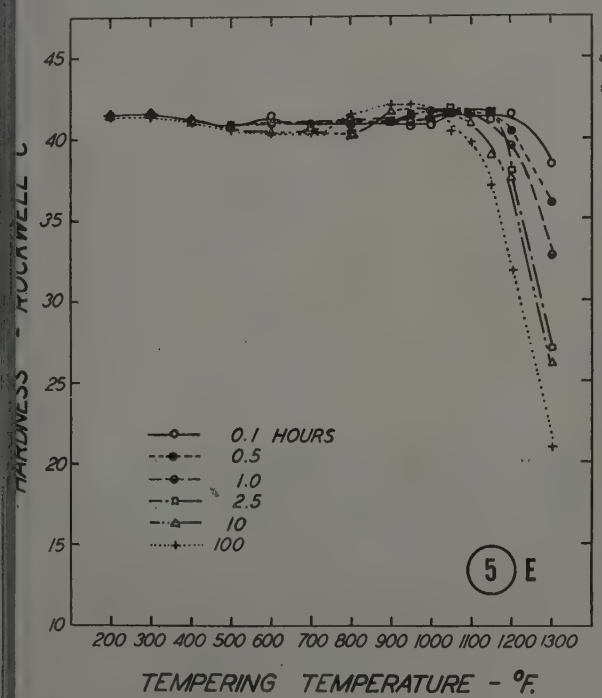
Data covering tempering characteristics of three cold working and two hot working, highly alloyed die steels are given in this second and concluding article of the series

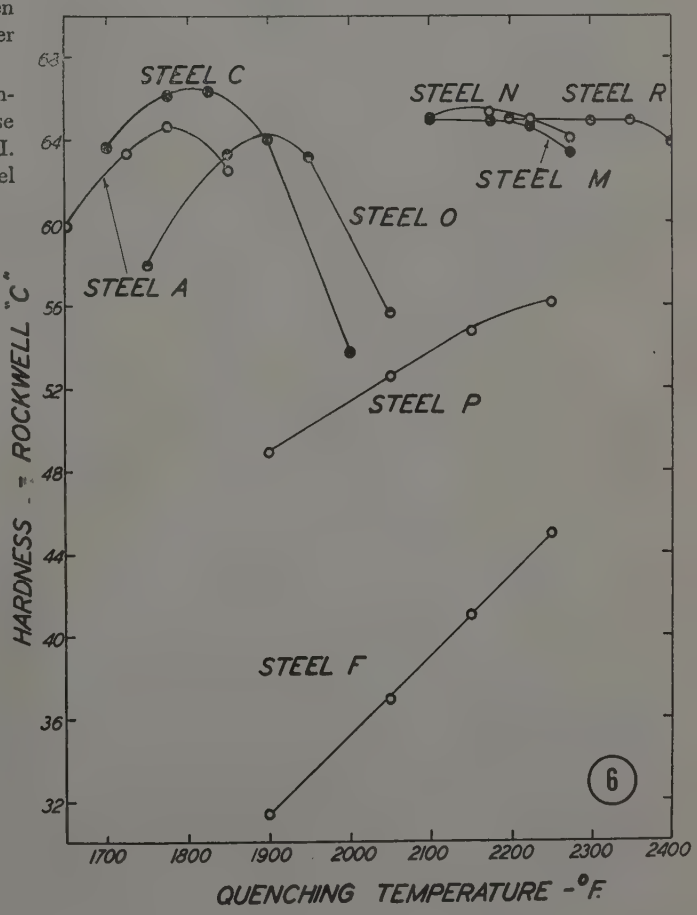
IN THE first part of this article data were presented covering the investigation of the relation between hardness, tempering time and tempering temperature for three commonly employed high speed steels. These data have been supplemented by a similar study on three highly alloyed die steels generally applied for cold working applications and on two alloy die steels of importance in hot working applications. Compositions of steel employed are shown in Table III.

Of the cold work die steels, steel A is a 5 per cent carbon, 1 per cent molybdenum air hardening die steel and steels O and C are high-carbon, high-chromium steels. Steel O is an air hardening 1.5 per cent carbon steel of this class, while steel C is an oil hardening grade containing 2.2 per cent carbon. The two hot work die steels include steel F, a low carbon 14 per cent tungsten steel, and steel P, a 9 per cent tungsten steel with 2 per cent chromium and 0.35 per cent carbon.

Experimental techniques employed in determining tempering characteristics of these die steels duplicate those employed for the high speed steels described in Part I. Four hardening temperatures were selected for each steel with the exception of steel C, in which case an additional high temperature treatment was used because of the susceptibility of this steel to large amounts of retained austenite and a need for the study of the tempering reactions when such large amounts are found.

The hardening temperatures and hardening media are listed in Table IV, along with the minimum, maximum and average values of quenched hardness found on the





120 individual samples hardened from each temperature. Where possible, intercept grain size determinations were made; these are also listed in Table IV.

Ninety samples nearest to the average hardness were selected for tempering experiments which were conducted with tempering temperatures ranging from 200 to 1300° F and with tempering times ranging from 6 min to 100 hours. Fig. 6 illustrates the effect of quenching temperature upon the quenched hardness of the five die steels, as well as the three high speed steels previously described. The three die steels for cold work A, O and C, all have extremely narrow temperature ranges for maximum quenched hardness. The small amount of published information on the effect of hardening temperature upon the retained austenite content of steels A and O indicates that again over 30 per cent austenite is necessary to cause the drop in hardness noted at the most elevated temperatures.

Hot work die steels, F and P, do not achieve retained austenite contents in amounts which cause a hardness drop at the highest temperature used. The hardness of the 9 per cent tungsten steel, P, is considerably greater than the 14 per cent tungsten steel, F. This is not solely caused by the lower carbon content of steel F, but is also related to the fact that 14 per cent tugsten will not permit the formation of pure austenite at any temperature up to the melting point with only 0.26 per cent carbon. Even at 2250° F approximately 30 per cent ferrite appears to exist, permitting a hardness of only slightly over 45 rockwell C.

Tempering data for the five die steels are shown in Figs. 5a, b, c, d and e, in which hardness is plotted against tempering temperature for each of six tempering times. The charts presented are selected from the normally recommended hardening temperatures for each of the grades as follows:

Steel A ..... 1775° F

TABLE III
ANALYSES OF DIE STEELS

Steel Number	Type	C	Mn	Si	P	S	Cr	W	Mo	V	Co
A	1 C, 5 Cr, 1 Mo ...	1.01	0.70	0.32	0.014	0.015	5.36	....	1.06	0.26	....
O	1.5 C, 12 Cr, 1 Mo ..	1.55	0.28	0.42	0.010	0.015	12.01	....	0.94	0.87	0.44
C	2.2 C, 12 Cr	2.17	0.32	0.38	0.016	0.009	11.68	....	...	0.78	0.51
F	0.25 C, 14 W	0.26	0.31	0.10	0.018	0.013	3.60	14.30	...	0.40	...
P	0.35 C, 9 W, 2 CR ..	0.36	0.33	0.16	0.011	0.010	2.08	9.22	...	0.57	...

TABLE IV
HARDENING PROCEDURE, QUENCHED HARDNESS AND GRAIN SIZE

Steel Number	Quenching Temp. °F.	Quenching Medium	Quenched Hardness Range Rockwell C Min.	Max.	Avg.	Intercept Grain Size	"c" Value
A	1675	Air	59.3	60.3	59.8	..	17.6
	1725	Air	62.9	63.9	63.4	..	15.4
	1775	Air	64.6	65.6	65.1	17	16.6
	1850	Air	62.0	63.0	62.5	11	17.8
O	1750	Air	57.5	58.5	58.0	18	18.0
	1850	Air	62.8	63.8	63.3	13	17.0
	1950	Air	62.6	63.6	63.1	12	18.7
	2050	Air	55.2	56.2	55.7	9	21.6
C	1700	Oil	63.3	63.9	63.7	..	14.7
	1775	Oil	65.6	66.6	66.1	..	14.3
	1825	Oil	66.1	66.5	66.3	13	14.0
	1900	Oil	63.5	64.3	64.0	10	13.4
	2000	Oil	52.5	54.6	53.7	3	15.6
F	1900	Oil	30.7	31.7	31.3	..	19.9
	2050	Oil	36.4	37.7	36.9	..	23.4
	2150	Oil	40.7	41.7	41.2	..	29.3
	2250	Oil	44.4	45.4	44.9	..	30.2
P	1900	Oil	48.5	49.4	48.9	..	19.7
	2050	Oil	52.1	53.1	52.6	14	18.6
	2150	Oil	54.2	55.1	54.7	11	18.5
	2250	Oil	55.6	56.6	56.1	4	19.7

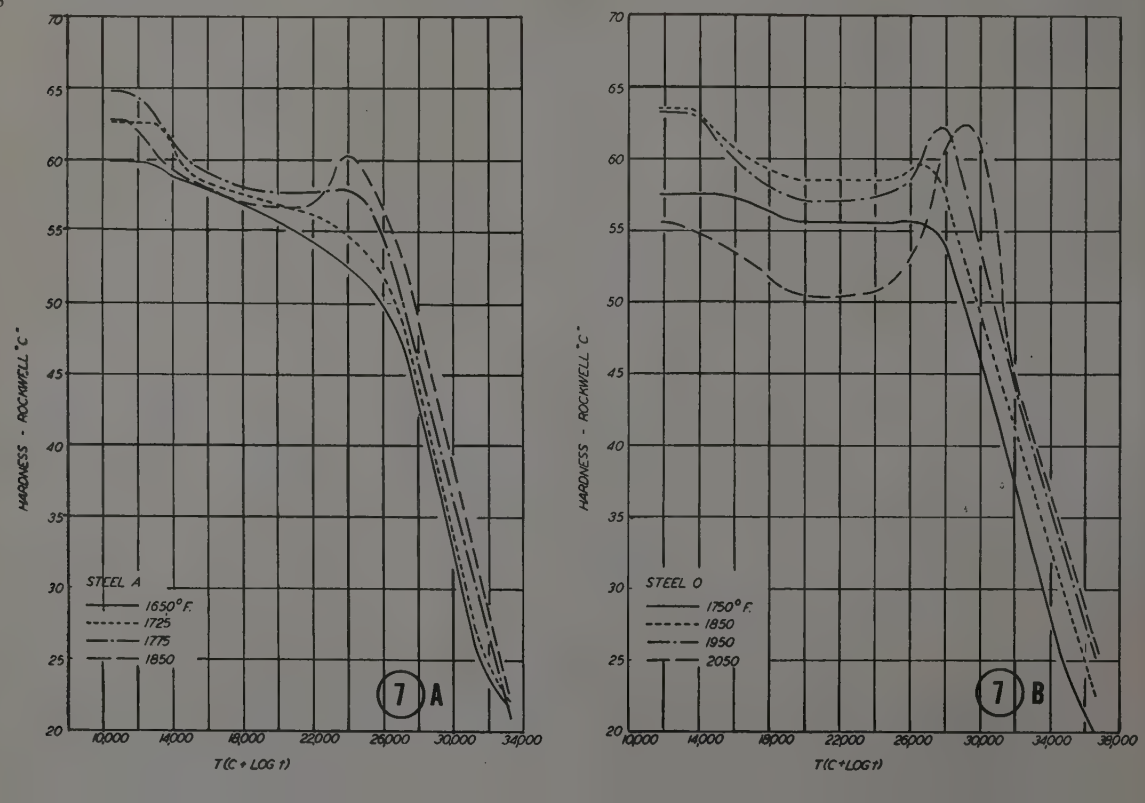


Fig. 7—Master tempering curves for cold work and hot work die steels. (a) Steel A "c" 16.9, (b) steel O "c" 18.9

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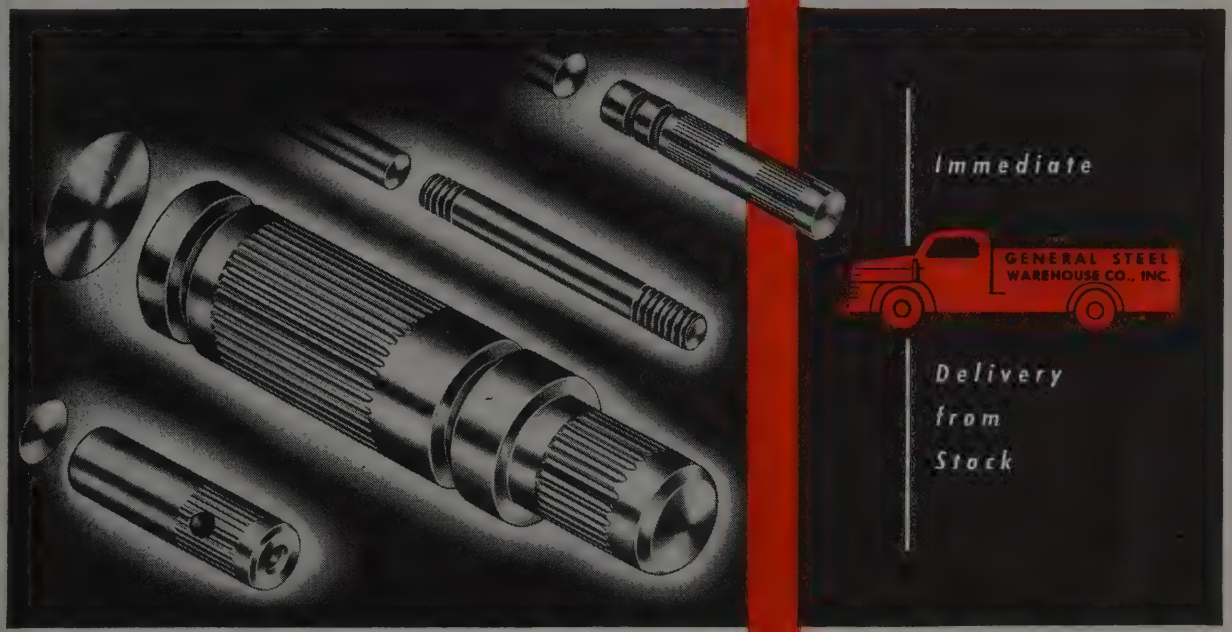

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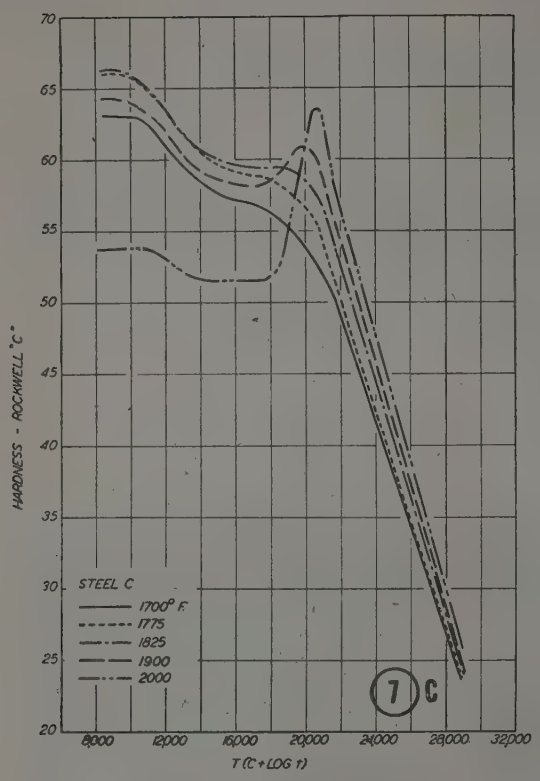
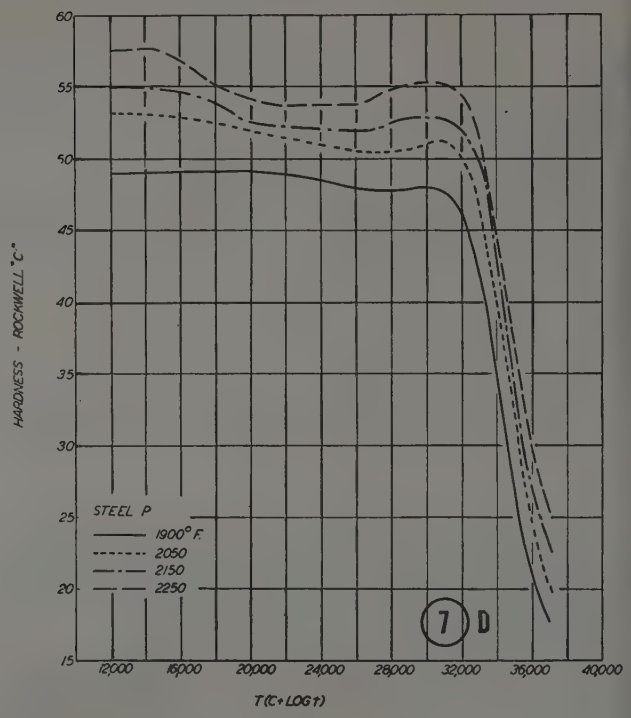
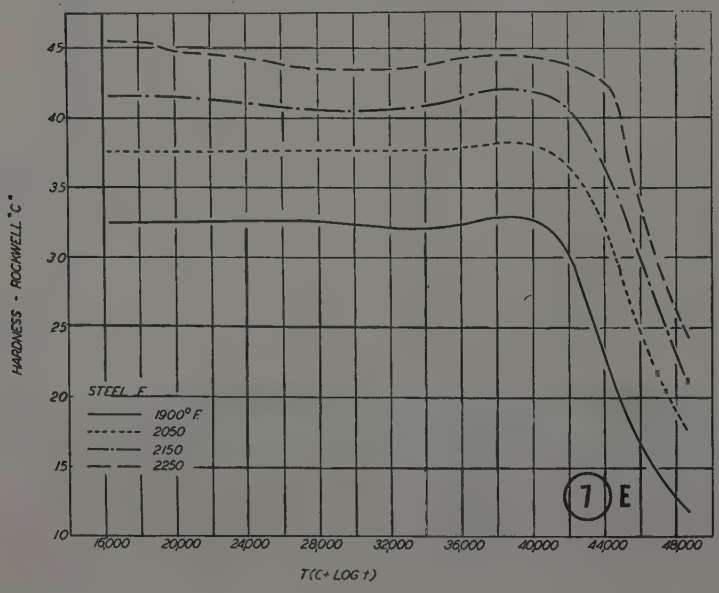




Steel O	1850° F
Steel C	1825° F
Steel P	2150° F
Steel F	2150° F

As with the high speed steels described in Part I of this article, all of the tempering data shown in each individual portion of Fig. 5 may be combined into one single master tempering curve by the use of the tempering parameter T (c + log t). This has been done in Figs. 7a, b, c, d and e for the five die steels in which the master tempering curves for each of the hardening temperatures employed are shown. Here again it was found that the selection of one value of the constant c would yield sufficient accuracy to permit its employment for each steel. The individual c values are shown in Table IV, and may be compared with the average c value for each steel shown in the captions under Fig. 7.

Fig. 7—(c) Master tempering curves for cold work and hot work die steels. Steel C "c" 14.4, (d) steel P "c" 19.1, (e) steel F "c" 25.7



Cold work die steels all have essentially the same resistance to tempering. Secondary hardness peaks are most prominent in steel O when quenched from normal hardening temperatures but the master tempering curves show that all grades exhibit secondary hardening phenomena to an increasing degree as the hardening temperature is advanced.

This is especially pronouced in the high-carbon, high-chromium steels O and C. Had hardening temperatures in excess of 1850° F been used for steel A, it too would show a marked effect in this connection. Here again definite indications of retained austenite are shown by the drop in the hardness minimum at intermediate tempering temperatures with increasing hardening temperature.

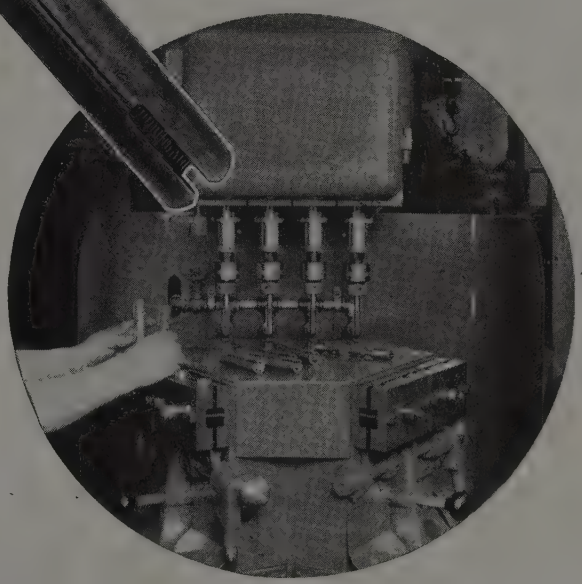
Tempering curves for the two hot work die steels show a peculiar behavior of little or no change in hardness with tempering time or temperature up to about 1000° F. Above this temperature the behavior appears normal in that the hardness drops with increasing temperature and increasing times. The fact that little drop in hardness is noted when tempering at intermediate tempering temperatures can be ascribed partly to the fact that little or no retained austenite exists in these steels.

M-11 TAPS

Boost Output per grind 185% on turnbuckles

(plus 33% more grinds per tap)

Condition of hole: un-drilled.
Material: SAE 1020 cold-rolled flat stock rolled to shape.
Stock thickness: 0.125 inches.
Length of full thread: 2¼ inches.



The average high speed steel tap produced some 175 pieces in this operation before re-grinding was necessary.

Taps made of "M-11" (Detroit Tap's exclusive chrome-cobalt HSS) however, average 500 finished turnbuckles per grind. In addition, it was found possible to re-sharpen the "M-11" taps 8 times as against 6 for conventional HSS.

Equipment now used to produce some 12,000 parts per machine per 24 hour day are two specially designed "Detroit" 4-tap multiple head lead-screw machines with indexing fixtures, having automatic clamping, automatic unloading and simple manual loading. Spindle speed is 250 RPM while tapping, 500 RPM for backing out. Taps are 11/16" – 18 RH and LH, and of course are "M-11".

***M-11 steel is used exclusively in Detroit taps, thread milling cutters and thread plug gages.**

The reason why taps of M-11 steel* give such outstanding performance is that the steel has higher abrasion resistance (longer life); higher toughness with hardness (less chance of breakage or chipping); higher red hardness (efficient tapping at higher speeds); and higher torsional strength (greater resistance to twisting and breakage). Yet they cost no more.

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Engineering News *at a Glance*

"BLUSHING SKIN" FOR METALS: From St. Louis, Dennis Chemical Co. reports it now is making immediate deliveries on a newly developed protective, liquid-plastic coating for polished or bright metals. The coating, which is applied by spray or dipping, forms a tough, elastic film that is impervious to rust, chemical reaction, smears or normal handling. It instantly turns to a red color to warn against promiscuous rough handling of the polished surface. According to the company, parts protected with the "skin" may be completely fabricated before removing the coating. The covering is removed easily by picking up one edge of the skin with a finger nail, peeling off the entire surface in one continuous strip.

ASSURES HOB ACCURACY: Accuracy is assured on all hobs produced by Illinois Tool Works, Chicago, by means of a special inspection recording system developed by the company. Readings from sensitive inspection machinery are electrically recorded on what is referred to as the Toolgraph chart. This shows any deviation of the hob teeth from the theoretically desired lead helix at a glance. Because the system is entirely automatic and independent of the machine operator, there is no possibility of human error in the test results. Cutting edge of each tooth on the hob is represented by a peak in the inked line of the chart. Series of charted peaks forms a pattern that indicates clearly the nature and extent of any deviations in the tool itself. Now, each hob leaving the plant is accompanied by an individual chart which shows the user the accuracy and specific characteristics of the tool.

HUMIDITY, COLLAPSE FACTOR: High humidity as well as high temperature is an important causative of heat collapse, studies of the Army's Quartermaster Corps show. Obese persons are more susceptible to heat stroke than those of normal weight. Chief reason for heat collapse, the study reveals, is because the air, being heavily laden with moisture, cannot properly cool the body by evaporating sweat. Men working outdoors in extremely high temperatures often experience no ill effects from heat while those resting in tents suffer heat stroke. Fat persons are the more likely victims because heat is produced in proportion to body weight and is dissipated in proportion to area of skin surface. Unless the body heat can be lost to outside air, it keeps building up until prostration occurs. Another factor is that fatty tissue does not contain as many blood capillaries as muscle tissue and therefore, does not function as well in carrying heat to the skin surface. While some persons are able to acclimatize to heat within a week or 10 days, a large percentage of deaths occur after the victims spend up to 4 weeks in hot areas. Fairly complete immunization is obtained by the end of 8 weeks, according to the study. However, actually working in heat is necessary for full acclimatization.

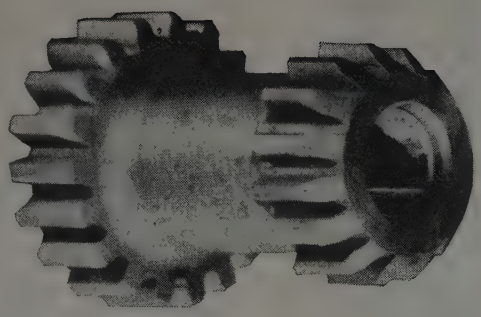
WASHING PLANT TAKES STEEL: Installation of steel structures and machinery has already begun at the huge coal washing plant being erected by McNally-Pittsburgh Mfg. Corp. at the Gary, W. Va. mine of United States Coal & Coke Co., U. S. Steel subsidiary. Nearly 20,000 cu yd of concrete structures and foundations were recently completed for the million-dollar project by Rust Engineering Co., Pittsburgh. The plant, expected to be ready for operation early next year, thus far includes a 12,500-ton blending bin, a 6000-ton raw coal bin, a combined refuse bin and suspension bridge anchorage, a domestic coal bin, foundations for preparation building, bridge piers, extensions for two mine dumps, Barney coal haul, railroad car dump and transfer house.

TO TEST LOCOMOTIVE TURBINE: Complete factory test program of a 4800-hp locomotive gas turbine which harnesses superheated gases to drive turbine "buckets" at rifle bullet velocities of 1200 ft per second was due to start last month at Schenectady Works of General Electric Co., according to Alan Howard, engineer. The development is expected to prove attractive for many other portable or stationary installations. Present development burns bunker C fuel oil in six all-metal combustion chambers. Preliminary studies, Mr. Howard said, indicate the same unit can be adapted to use of pulverized coal as fuel.

"UNDERGROUND" SCRAP PICKUP: Underground system of picking up metal chips and shavings at Canton Drop Forging & Mfg. Co., Canton, O., is capable of gathering about one carload of scrap per day whenever the plant operates around the clock. The system is dependent on two automatically-operated magnet carriers that run only 12 hours each day. In the setup, scrap from metalworking machines on the first floor is emptied through chutes into two parallel tunnels dug out in the ground below. The tunnels include an "overhead" Cleveland Tramrail track on which the carriers travel. These tracks also lead to a bin from where scrap is conveyed to railroad cars outside the building. Thus when the carriers travel away from the bin, the 36-in. magnets are "dead." But when traveling toward the bin both are powered and pick up metal as they move along. The carriers make a round trip in about 3 min, and each time as they arrive at the bin, power to the magnets cut off and the loads are dropped. For a distance of 70 ft, before the magnets reach the storage bin, the carriers pull their own loads up an incline of about 13 per cent.

TRACER MICROGRAPHY: New, more effective method of tracing radioactive isotopes in materials in which they are intentionally introduced was developed by L. Marton, National Bureau of Standards, with the co-operation of P. H. Abelson, department of terrestrial magnetism, Carnegie Institution of Washington. It is dependent upon a magnetic focusing arrangement. In the procedure, radiation from a radio-isotope within a sample material is made to form an image of the emitting surface upon a photographic plate. Image then may be used in studying the distribution and concentration of the radio-active element present in the sample. One of the more important features of the method, referred to as tracer micrography, is its simplicity—both in apparatus and technic. It is reported that vacuum requirements are very moderate, since the mean free path of the electrons is large in comparison with the apparatus dimensions, even at forepump pressure.

WORK ON COLD-DRAWN STEEL: Preparation of standard specifications for cold-drawn steels is now being undertaken by a new division under the Society of Automotive Engineers' iron and steel technical committee, it was learned recently. Initial work of the group, comparative testing of auto propeller shafts of 125,000 psi cold-drawn, cold-drawn stress relieved and heat treated steels, is designed to establish physical properties and to suggest potential applications. Tests further are intended to substantiate present beliefs that a wide range of physical properties of steel can be developed by cold work which, accelerating machining operations two to six times those of heat treated steel and drastically curbing losses in the process, afford substantial savings in production time and costs. Data will be sought on retention of impact strength, relieving trapped stresses, and relative shear—all in comparison with hot rolled steel.



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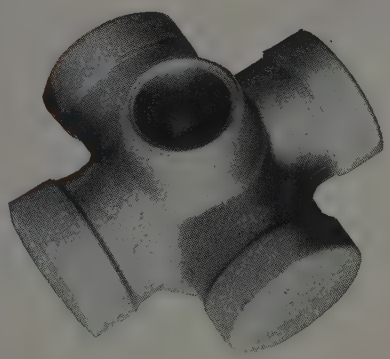

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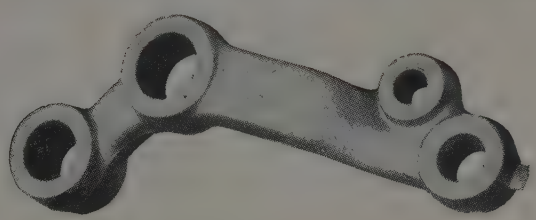

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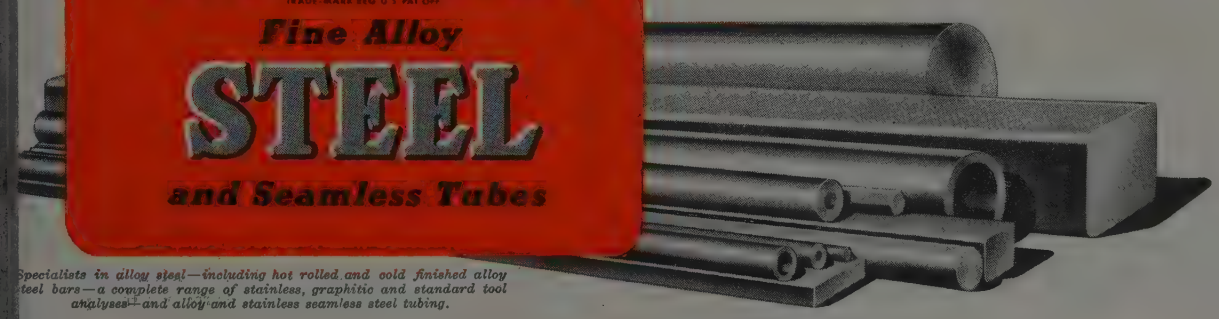

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AUTOMATIC OPERATION OF THE Electric Arc Furnace

Equipment for controlling the position of furnace electrodes effects reduction in power costs, heating time and maintenance. Variable-speed control of motors provides smoother deceleration of electrodes benefiting life of mechanical parts

REGULATOR of an electric arc furnace is a positioning device. Its function is to lower the electrode until it makes contact with the furnace charge, to position the electrode to produce the desired heat, and to maintain this heat at a constant value.

Once an arc furnace is charged and the circuit breaker closed, operation is automatic from then on. The regulator starts lowering the electrodes and current flows the instant two of these make contact with the charge. The inrush current may be high, depending to a great extent on the reactance of the circuit. Regardless of the magnitude of the initial current surge, the regulator raises the electrodes a sufficient distance to establish the arcs.

As soon as the arcs are established, the regulator maintains the distance constant between the electrodes and furnace charge to provide the desired heat input into the furnace. This requires continual readjusting of electrode position for the reason that the arc itself consumes electrode material and the fact that until the charge becomes molten, the surface shifts and moves as liquefaction takes place.

Fig. 1—Melting down the charge in a 10,000-kva 3-phase Heroult type electric arc furnace
Fig. 2—Arc furnace regulator for automatically positioning the electrodes with respect to charge

Electrode boring into the scrap is highly desirable as this assures a "hot furnace bottom" and minimizes the heat lost to the furnace sidewalls. Boring takes place for the reason that the charge melts immediately beneath the electrode ends. As the electrodes bore into the furnace charge, heavy scrap frequently falls against them causing a violent upswing in current. The electrical equipment is designed to sustain these sudden current increases for the time intervals required for corrective action. Opening of the furnace circuit breaker is one means of correction. However, in order to maintain a more constant heat input and to minimize the number of circuit breaker operations, movement of the electrodes is the more desirable means of correction. The electrode position controller, therefore, is in almost constant motion; first, to keep up with the furnace charge during meltdown; and second, to compensate for electrode consumption.

A regulator that adequately meets the demands imposed by the arc furnace is the Rototrol rotating regulator consisting primarily of a static current and voltage responsive circuit and the Rototrol proper. The latter is a direct current generator conventional in appearance and mechanical design, but having different electrical circuits, mainly additional field windings. It is designed to measure a number of electrical quantities and to supply an output in response to the quantities being measured. The measuring element is the field; the output element is the armature.

Generator output is a current, the polarity and amplitude of which is determined by the electric quantities being measured. The output current is used to drive the electrode positioning motor either directly, or through an amplifying generator. When used to drive the electrode positioning motor directly, the Rototrol armature is connected to the electrode motor armature. When used to drive the electrode positioning motor through an amplifying generator, the output is connected to the field of the amplifying generator and the armature of the amplifying generator is connected to the armature of the electrode positioning motor as shown in Fig. 3. The polarity of the output voltage is determined by the factor in the measurement that predom-

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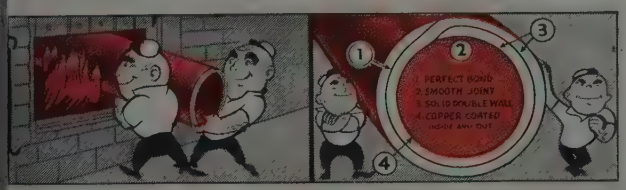

3 . . . copper coating fuses and alloys with the double steel walls. After brazing and cooling, it becomes a solid double wall steel tube, copper brazed throughout 360° of wall contact . . .

4 . . . copper coated inside and out, free from scale, closely held to dimensions. Hard or annealed in standard sizes up to 5/8" O.D. Special sizes cold drawn. Also in Monel and nickel.

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12½-pound Keokuk Electro-Silvery Piglets so uniform in weight that they may be charged into the cupola by count, eliminating weighing operations. Handle by magnet. Regular or alloy analysis.

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nates; arc current or arc voltage. The output amplitude ranges up to, and sometimes slightly higher than, the rated voltage of the electrode motor.

The armature of the Rototrol, in which the output voltage is developed, is of standard design, being similar to that used in a direct current generator of corresponding size. Air gap, brush rigging and brush setting likewise are standard. It is in the measuring element that the generator deviates from the usual direct current generator design.

Two measurements must be made for proper control of an electric arc furnace; the current carried in the electrode, and the voltage appearing across the electrode.

A fixed proportion of the electrode current is obtained from a suitable current transformer that is usually connected directly in the low-voltage high-current secondary bus work of the furnace power supply transformer. The current transformer output is converted to direct current by dry type rectifiers and applied to a Rototrol field designated as a current field.

The arc voltage, being the voltage between the electrode and the furnace shell, is likewise converted by dry type rectifiers and applied to a Rototrol field called the voltage field.

The voltage field is connected in opposition to the current field. Each serves as a reference against which the other is compared and the resultant effective field ampere-turns control the output of the Rototrol. Suitable balancing adjustments are provided so that for a predetermined condition the ampere-turns of one field are equal and opposite to those of the other. Thus, for a steady-state condition in the furnace, when the field flux corresponding to electrode current is equal and opposite to the flux corresponding to arc voltage, the Rototrol generator output is zero and the electrode positioning device is at rest. However, when either the electrode current or the arc voltage is disturbed, the flux produced by the difference between the current field and the voltage field ampere-turn acts as the initial excitation of the Rototrol and a rapid sequence for repositioning of the electrode is initiated, with restoration of the balance as the end result.

Connected to the Rototrol generator output, generally in series, is a third field winding. This third field, the self-exciting field, assists in increasing the initial output as established by the difference between the current and voltage fields and making this output a large and more effective quantity. Where the electrode positioning device is driven by a ¾-hp motor or less, the Rototrol output is sufficient to make the positioning correction. Where the electrode driving motor is larger than ¾-hp, additional amplification

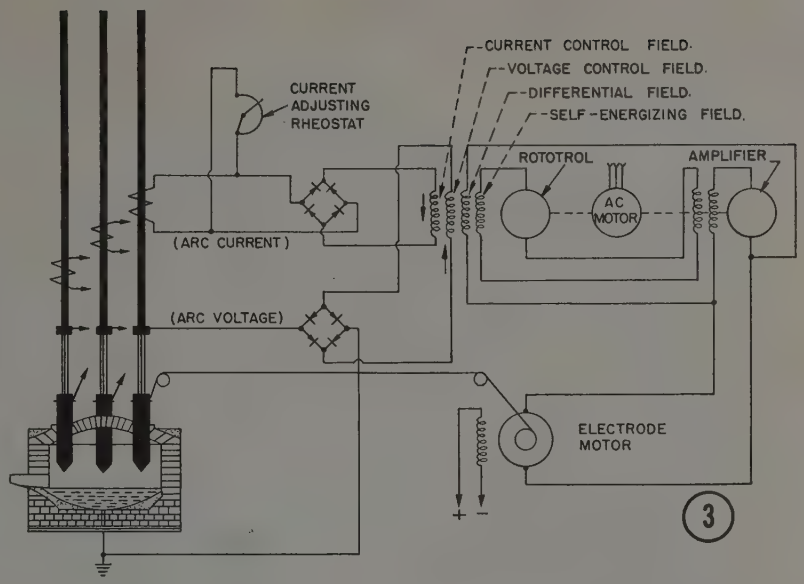

Fig. 3—Sketch showing how the regulator combines the measures of arc voltage and current in its separate fields

of the Rototrol output is required.

Another field, the differential field, is connected in opposition to the self-exciting field and in a like manner is supplied by the Rototrol output, either from the generator direct or from the amplifier. It is the purpose of the differential field to stabilize the generator output.

Common to all direct current generators the relationship between the generator output voltage and the generator excitation is a straight line up to the point where the generator magnetic circuit approaches saturation. Where this occurs increasingly larger increments of excitation are required for proportionately smaller increments of generator voltage, until the point is reached where a further increase of ampere-turns of excitation will no longer produce a further increase in generator output voltage. In general, the generator excitation is proportioned so that the output is held to the straight line portion of the machine's magnetization curve.

Inasmuch as the Rototrol excitation is initiated by the measurements of electrode current and arc voltage and the output is proportioned to the excitation supplied by these measurements, the speed with which the corrective device responds is affected by the amount of correction required. The voltage applied to the electrode positioning motor is the output. The magnitude of the output will vary directly with the input. The input is proportional to the difference between the predetermined balance of electrode current and arc voltage as momentarily found in the furnace. If this unbalance is excessive, a relatively high voltage is impressed on the electrode positioning motor causing it to operate at a relatively high speed. As furnace conditions approach the predetermined balance, the Rototrol excitation decreases, output decreases and the electrode positioning motor response slows down. Thus, variable-speed control of the electrode motors provides smoother deceleration of furnace electrodes with resultant benefits to mechanical parts and electrode life.

The polarity of the Rototrol output determines the direction of rotation of the electrode positioning motor. Affected again by initial excitation, an increase in current through the current field will tend to raise the position of the furnace electrode while an increase in current through the voltage field will tend to lower the furnace electrode. Restoring furnace conditions to those desired is thus achieved by the interaction of the Rototrol fields.

Suitability of electrical equipment for a particular application frequently depends as much on mechanical design as on the electrical characteristics. The physical arrangements of the arc furnace Rototrol motor-generator set have been considered for the service requirements, and features such as ease of replacement and accessibility have been built into the equipment.

Each furnace electrode has an independent motor-generator set. Each unit is driven by a standard squirrel cage 3-phase induction motor at a speed of 1750 rpm and is of the totally enclosed self-lubricated ball-bearing type. Fig. 2 shows the three individual motor-generator sets mounted on a fabricated steel rack, one above the other in order to save floor space. The rectifiers, resistors, and motor starting switches are mounted

(*Please turn to Page* 124)

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Tensile Testing

(*Continued from Page* 91)

to set up the test, and, to a lesser degree, to the variation in the location of the test specimen with respect to the axis of the furnace.

As may readily be seen, this method of testing presented several disadvantages. The primary one, from the standpoint of machine utilization, was that while a test was in progress the machine was tied up and out of use for other testing work. Thus, while about 5 min were required for the actual testing of the specimen, the machine was out of use for some 75 min to permit the setting up, heating, soaking and testing of the specimen.

Second major disadvantage was the manual control of the temperature of the specimen, which required nearly constant attendance of the operator and thus made him unavailable for other test work. Other items of lesser importance were the need for two temperature instruments to control the specimen temperature, and the lack of uniformity in the heating cycle for successive tests. A new testing procedure, together with suitable fixtures, eliminated all of these disadvantages and gave over six times as many tests with no increase in the number of testing machines or personnel.

First step in improving the testing procedure was to devise some method of using more furnaces on the same testing machine. A study of the cycle time dictated the choice of six furnaces per testing machine. The conditions to be met were: (1) The test specimen had to be set up, heated and soaked outside of the testing machine: (2) The necessity of holding the test specimen in the center of the furnace at all times: (3) No interruption in the heating cycle when the specimen is placed in the testing machine for test: (4) The location of the specimen in the testing machine must be easy and positive.

Fig. 5 shows a six-furnace rotary unit arranged at the testing machine. The rotary unit has six arms, each of which supports one furnace. All power and thermocouple leads are dropped from above, and the flexibility thus introduced permits the furnace to be rotated to bring the proper one into position for transfer into the testing machine. The transfer is accomplished by sliding the furnace along the rail to a stop which positions the test specimen in the center of the testing machine. The test specimen is held in two holders that are fitted with female clevis halves on the outer ends.

Locating Bar in Furnace

Test bar is located in the furnace by the upper clevis, which rests on a split cover which centers the bar and also closes the top of the furnace. A similar cover on the bottom performs the same function on that end. A single thermocouple is used, and is tied onto the test specimen at the center of the test length, brought out through the top cover and fastened to the terminal block on the side of the furnace.

Fig. 1 shows a test specimen assembled for test, and an exploded view of one end of a specimen holder. The parts of the specimen holder are made of a high-temperature alloy similar to the alloys being tested. The purpose of making the holder in three pieces is purely economic.

The clevis half is outside the heated zone, and, since it does not suffer from scaling, will last indefinitely. The clevis halves made in 1940 are still in active use. The main body of the holder is 1¾-in. in diameter, and the lower end has a 1-in. —8 tapped hole to take the insert.

This portion of the holder generally fails by scaling and subsequent cracking in the vicinity of the tapped hole, since this portion is heated to test temperature at each use. This failure is not too frequent, but the part should be replaced after about 4000 tests.

Insert has a ⅜-in. —16 tapped hole to accommodate the test specimen, and failure of this part occurs by scaling and subsequent stripping of the threads. The life of the insert is fairly low, averaging about 400 tests at 1500° F, but the part is simple to make and is inexpensive to replace.

Testing machine has two male clevis halves attached to the standard specimen holders. When the specimen has been heated and soaked for the proper time, the furnace is slid into position in the testing machine, the two clevis pins inserted, and the specimen is ready for test.

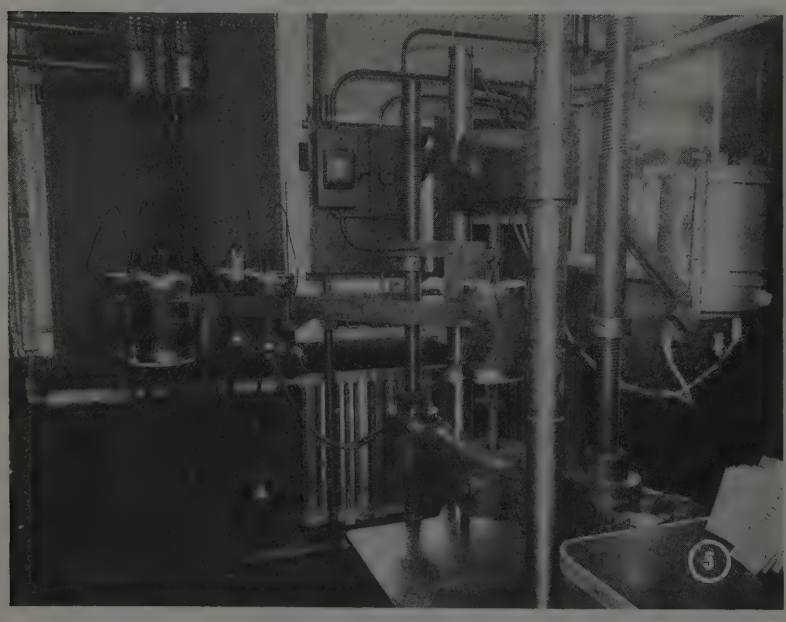
After the specimen is broken the pins are removed, the furnace slid out of the machine, and the unit rotated to bring the next furnace into line for testing. The covers hold the chucks in the furnace after the specimen is broken, and the furnace can be emptied and reloaded at the operator's convenience.

Extra sets of specimen holders are provided so that a new assembly is always ready to be inserted, and the time lost in reloading is very small. With this testing arrangement the time per specimen is about 12 min, as compared to the 75 min previously consumed.

To take advantage of the increased production which is made possible by the above furnace arrangement, it is necessary to relieve the operator of the necessity of controlling the temperature. Various methods of automatic control were investigated.

Most obvious method was to connect the single thermocouple to a recording controller and use a straight "on" and "off" control. Tests of this method indicated three major difficulties. Since the furnace winding is on the outside of the furnace core, the lag between the temperature of the furnace winding and the temperature of the specimen caused the winding to reach a dangerous temperature which might burn it out in a relatively short time. It also caused the temperature of the specimen to overshoot

Fig. 5—Six-furnace testing machine with one specimen in position ready for the test



Heavy Packs of Steel Sheets

This crane, though heavily loaded, is hand-propelled and easily moved. The electric hoist does the heavy lifting. Note high piling and small aisle space.

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Both hoist and carrier travel of this overhead unit are motorized and operated by the pushbutton station in the worker's hand. Heavy loads of sheet steel are held securely in place with the sheet grab during transportation.

Much sweat is excreted and time lost in many plants in the handling of steel sheets. Diebold, Incorporated (formerly Diebold Safe & Lock Co.), Canton, Ohio, manufacturers of bank vaults and metal doors, now engaged in producing armor plate, have simplified the problem of handling great tonnages of steel sheets that they consume, with Cleveland Tramrail overhead materials handling equipment.

In one sheet storage department, Diebold employs a hand-propelled crane with electric hoist. In another department it has a rail system on which a motor-driven carrier, with electric hoist, operates. The carrier makes it possible for one man to unload heavy packs from incoming trucks and take them directly to the storage area. The packs are carried in hand-manipulated grabs which hold the sheets securely until released.

Considerable space is saved with the overhead system because the packs can be piled higher and very little aisle space is needed. Cost of a sheet-handling installation is soon charged off through handling savings. Injuries are greatly reduced with this equipment.

A large number of plants are equipped with Cleveland Tramrail sheet-handling equipments. Our local representative will be glad to work with you on your handling problem.

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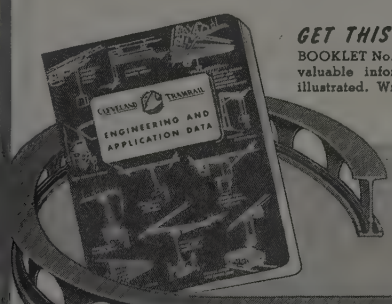

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OVERHEAD MATERIALS HANDLING EQUIPMENT

the test temperature, and there was a cyclic temperature variation at the control point of about 40° F.

In an endeavor to reduce these conditions, a series resistor equal in value to the resistance of the furnace was used and the controller was arranged to short out the resistor when the furnace called for heat. This had the effect of applying full power during the "on" portion of the control cycle and 25 per cent power during the "off" portion. The overall effect of this attempt was to reduce the magnitude of the variation and overshoot. It still left much to be desired as far as protection of the winding and fluctuation of temperature was concerned.

After several other procedures were investigated, a new method of controlling was devised which gave very satisfactory results. The series resistor was retained, and the controller was used to short it out as above. The wiring diagram of the controller is shown in Fig. 2 and the operation of the controller can best be understood by reference to it. The controller is a modified recording-controller.

Operation of Controller

Contact H_2 is on a fifth disk on the control shaft carrying the slide wire and standard control disks, and is set to close when the temperature rises to about 200° F below the control point. Contacts A and B are operated by two cams on a single shaft driven by a Telechron motor at a speed of 2 rpm. Contact A is closed for one-third of a revolution of the cam shaft, or a time period of 10 sec, and is open for the remaining 20 sec of the cycle.

Contact B is open for an instant and is closed for the rest of the cycle. The instant of opening is adjusted to occur immediately after contact A is closed. Relay D was added to carry the full furnace current and eliminate the need for an additional relay on the panel. The contact of relay D is used to short out the series resistor in the furnace circuit.

Assume that the test specimen is set up and the main switch is closed. This starts the controller and supplies 220 v to the furnace circuit. Since contact H_2 is open, the Telechron motor is stopped. Contact L is closed, so coil C is energized, closing C_2 which energizes coil D and closing D_1, which shorts out the series resistor and applies full power to the furnace.

This condition continues until a temperature about 200° F below the control point is reached, at which point the contact H_2 closes and starts the Telechron motor. This operates the contact A, and puts full power on the furnace for 10 sec and 25 per cent power for 20 sec, or provides an effective power input of 50 percent.

This is sufficient to cause the temperature to continue to rise until the contact H closes, shorting out the coil C opening C_2, thus cutting the power to coil D and opening D_1, leaving the series resistor in the circuit and the furnace drawing 20 per cent power.

Temperature Levels Off

If this occurs when the contact B is closed, the Telechron continues to rotate the cam shaft until A closes and B opens, stopping the Telechron motor. This leaves the system in a condition that will supply full power to the furnace as soon as the controller calls for heat. Since the 25 per cent power is not sufficient to maintain the temperature of the specimen, the temperature will level off and then start to fall.

As soon as the direction of rotation of the control shaft changes, the anticipator switch AH opens and AL closes, so that the coil C is again energized, the contact C_2 closes, and the Telechron motor starts, starting the cyclic power input. As the temperature starts to rise, the direction of rotation of the control shaft changes, and the condition of the anticipator contacts reverse and the coil C is shorted, placing the furnace on 25 per cent power as described above.

This cycle repeats as often as necessary to maintain the bar at the control point, and with the proper setting of the various contacts and the proper value of full power, the temperature swing about the control point may be kept below —5° F. Fig. 3 shows the approximate setting of the various contacts and a typical temperature record and power input curve.

Fig. 4 shows a close-up of the records obtained during production runs on the unit, and the uniformity of the records can readily be observed. Each unit has a Variac and an ammeter in the 220 v line to adjust the maximum current supplied the furnace when full power is being used. A single switch controls both the 110 and 220 v lines, so that the control instrument and the furnace are both controlled at once. A pilot light shows when the unit is in operation.

This unit was designed especially to make tests at 1500° F, but has been used in development testing over a temperature range of 250 to 1800° F. A single experienced tester can easily average 35 tests per shift, including all the setup and recording of the test data. Some operators have even completed more than 45 tests in a single shift.

The unit is very compact and the conservation of space and manpower made it a valuable asset during the high production of the war years. In any plant when elevated temperature testing is required this type of equipment w prove an invaluable aid in getting th most from a single testing machine with out placing an additional load on th testing staff.

One word of warning should be adde for consideration in any high temperature tensile testing. During the pr liminary work on the development of th testing method, some work was done the investigation of the rate of loadi and its effect on the properties dete mined during the test.

On hot rolled material, an increase tensile strength of nearly 20 per cent w noted as the rate of application of loa was increased from 50 to 400,000 p per minute. Testing on cold worke material of the same composition showe very little increase in tensile strength the rate of loading was increased, provi ing the cross-head travel was mai tained constant throughout the test.

Effects of Cross-Head Speed

It was clearly demonstrated howeve that if the cross-head speed was increase after the bar had reached the maximu load, the load increased again an reached a higher value than would hav been the case if the cross-head spee had been maintained constant.

As a result of the above tests it ha been possible to standardize on a loadin rate of 100,000 psi per minute—10 pe cent within the elastic region, and maintain the cross-head speed consta throughout the remainder of the tes This loading rate on a 0.250-in. diamete specimen at 1500° F corresponds to cross-head speed of about 0.080-ipm.

This loading rate may not be the opt mum but in the interest of maintainin true comparison of the tests on variou materials it is essential that the loadin rates be maintained substantially co stant. The loading rate expressed pounds per square inch per minut makes this constant value applicable all sizes of specimens, but the cross-hea speed may vary as the size of the spec men varies.

Finite Differences Solve Heat Conduction Problems

Solution of transient state heat con duction problems by means of finit differences, often referred to as th Schmidt method,, is the subject researc series report No. 98, published by En gineering Experiment Station of Purdu University, LaFayette, Ind.

With many references found dealin with use of finite differences for th solution of specific conduction problem the stated purpose of this report is t bring the treatments for slabs, cylinde and spheres together under one cove

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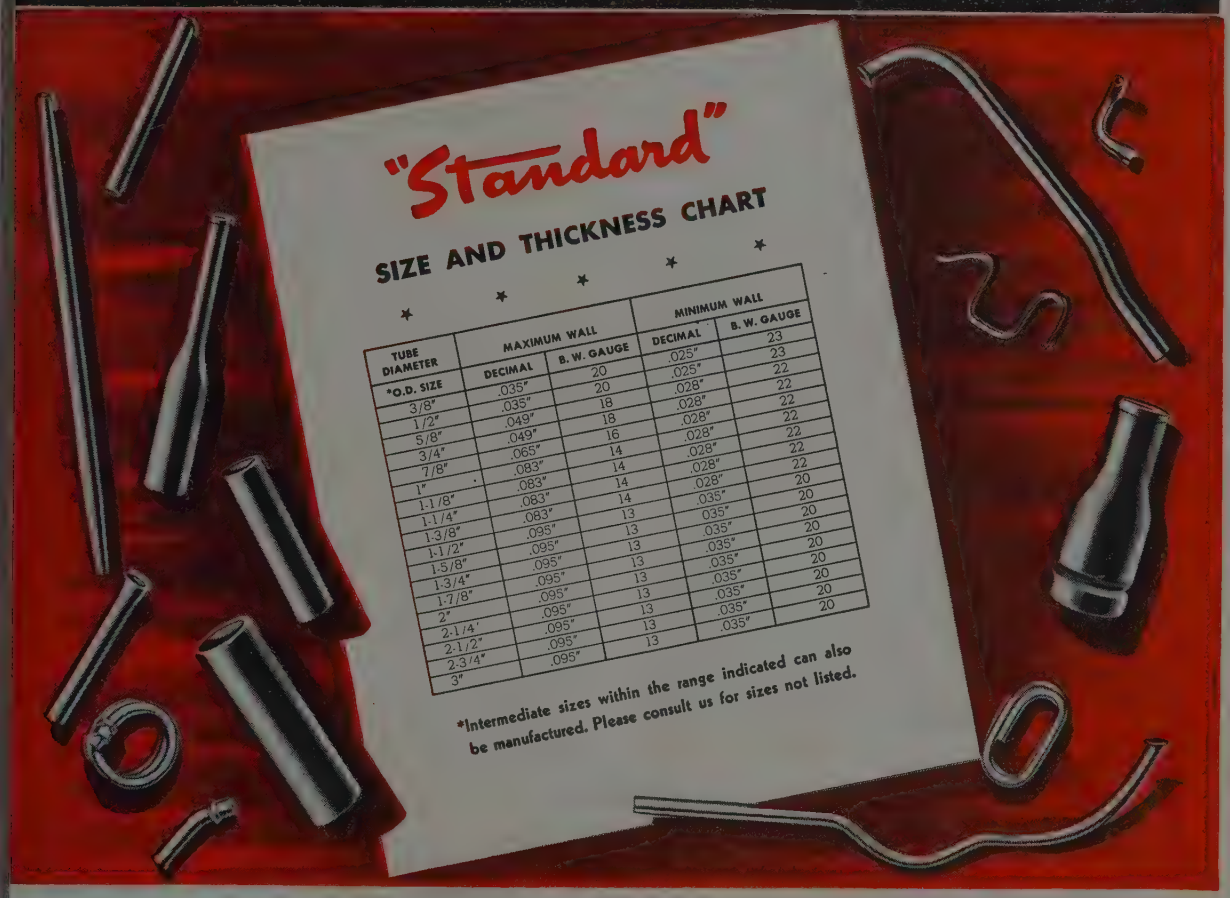

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5/8"	.049"	18	.028"	22
3/4"	.049"	18	.028"	22
7/8"	.065"	16	.028"	22
1"	.083"	14	.028"	22
1-1/8"	.083"	14	.028"	22
1-1/4"	.083"	14	.028"	22
1-3/8"	.083"	14	.028"	20
1-1/2"	.095"	13	.035"	20
1-5/8"	.095"	13	.035"	20
1-3/4"	.095"	13	.035"	20
1-7/8"	.095"	13	.035"	20
2"	.095"	13	.035"	20
2-1/4"	.095"	13	.035"	20
2-1/2"	.095"	13	.035"	20
2-3/4"	.095"	13	.035"	20
3"	.095"	13	.035"	20

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as Fluxing

(*Continued from Page* 89)

Although fluxing is in large measure sponsible for the refining of the molten aterial, furnace practice employed in melting is also closely associated with fining operations so that one can not be scussed in detail without the other.

gh Recovery: Many experts say that is not feasible to melt light aluminum rap except by immersing it in a molten tal bath. Yet all remelting at the plant done on sloping hearth furnaces—"in e air", so to speak. Furnace practice perfected to the point where even eet only 0.020-in. thick is remelted th a recovery of 96 to 98 per cent. nce 2 per cent can easily be lost in flux- operation, this means that no metal natever is lost from burning during e melting operation. This ability to re- lt sheet is of utmost importance in re- iming widely mixed scrap such as ecked and obsolete aircraft.

Complete recovery also places the oper- on on a sound economic footing since is evident that the greater the percent- e of aluminum recovered, the better e operation is from a dollars-and-cents ndpoint.

rnace Practice: A number of innova- ns in furnace practice have been devel- ed and used in conjunction with gas xing to help produce this excellent covery of high grade aluminum. Since y greatly influence refining practice, y will be described briefly at this nt.

Complete recovery of the fusible yet dizable aluminum is accomplished by ng a reducing flame at all times. The ping or sweating hearth type melting naces employed use two 6-in. Hauck burners, one firing crosswise the 15-ft g sloping hearth just inside the 8 x t charging door, the other firing gthwise about 3-ft above the molten tal in the 8-ft square holding hearth the opposite end of the furnace.

A reducing flame, obtained by supply- an excess of oil, prevents oxidation burning of even the thinnest sheet ce it consumes any oxygen entering furnace atmosphere during charging drossing operations.

paration Costs Minimized: Refining thods, including gas fluxing, take care any tramp metals that may be mixed with the aluminum on arrival; so there no need for expensive hand segrega- n. This is an important factor in put- g the reclamation operation on an nomical basis. No parts less than 8 wide are cut up. Even complete wing l fuselage sections from planes are lted without cutting. Melting sections long for the furnace is done in stages. Brass, iron and steel parts do not melt in the furnace and are removed from the sloping hearth by raking out through side doors. Most nonmetallic parts are vaporized and carried up the furnace vent. Remaining ash may be raked out through side doors or may be washed into the holding bath and skimmed off during drossing. Refining operations take care of other impurities as will be described.

Mechanical Charging: An important innovation at plant 5 is the development of mechanical methods of charging, in turn making possible greatly reduced operating costs since hand charging is expensive. Hand cutting is also practically eliminated since new furnaces on the main floor have 8 x 8 or 9 x 9-ft openings for charging, enabling them to take rough scrap as received. A rubber-tired crane operating up and down the charging floor picks up scrap directly from gondola cars alongside, using a clamshell bucket. The boom is swung around to the furnace and the scrap deposited on the elevated charging platform which is level with the sloping hearth inside the furnace.

When a charge has been accumulated on the platform, the furnace door is opened and the entire charge pushed into the furnace by means of a fork truck and a ram. Furnaces located too far from the railroad siding to permit direct charging as described above are fed by large bins carried by a fork truck. These bins are loaded near the gondola by a crane, carried to the furnace by the fork truck which then elevates the bin above the charging platform and dumps the bin by means of a special revolving head on the truck. The accumulated charge is pushed into the furnace with a ram, as previously described.

Each furnace is charged just as often and as fast as possible, the aim being to get a continuous melting operation. Molten metal is tapped off in 5000-lb lots, about half the content of the holding hearth.

Refining Methods: Development of effective refining methods has permitted the elimination of costly hand segregation, hand cutting and hand charging. Likewise, the aim in refining has been to eliminate hand operations. This successful application of mechanical methods has been extremely valuable in putting the entire operation on a paying basis. Previous efforts to utilize widely mixed aluminum scrap such as found in wrecked aircraft proved uneconomical because of expensive hand segregation, hand cutting and hand charging methods, and the fact that the metal obtained was of low quality.

Efforts to melt scrap in a large pot as practiced at some installations usually result in considerable iron pickup since the aluminum is in contact with iron in the scrap at temperatures where iron easily becomes dissolved in the aluminum. Use of the sloping hearth type of furnace permits the iron to remain on the hearth while the aluminum melts off of it and runs down into the holding hearth. Thus the molten aluminum does not remain in contact with the iron and so any tendency to pick up iron is avoided. This eliminates excessive iron contamination of the resulting reclaimed metal.

Melting thin aluminum "in the air" on a sloping hearth must be done with-

TABLE I

ANALYSIS OF NAVY RECLAIMED INGOT*

Element	Class A	Class B	Class C
Copper	4.50	3.50**	6.50
Iron	0.60	0.75	1.10
Magnesium	1.00	1.50	1.50
Manganese	0.50	0.65	0.65
Nickel	0.10	0.10	0.25
Silicon	0.50	0.50	1.00
Tin	0.10	0.10	0.15
Zinc	0.20	0.25	1.00
Lead	0.07	0.10	0.50
Chromium	0.10	0.10	0.10
Titanium	0.10	0.10	0.10

* From *Modern Metals*, April 1946, page 9. Another class (class D) makes up the remainder of the ingot produced by the Navy according to the following policy: When an activity is faced with a run of uniform, segregated material such as 3S fuel tanks and aircraft engine cylinders (high nickel), the metal will be stockpiled and properly identified; individual analytical records on heats of the class D ingot will be available.

** Includes a range from 3.50 to 5.00.

TABLE II

REYNOLDS RECLAIMED ALUMINUM VS STANDARD ALLOYS

	Reclaimed Aluminum 666		Standard Alloys	
Element	Average*	As Low As†	17S**	24S**
Iron	0.45	0.30	1.00	0.50
Copper	4.25	3.80	4.50	4.90
Magnesium	0.25	Trace	0.80	1.80
Manganese	0.55	0.45	1.00	0.90
Chromium	0.01	Trace	0.25	0.25
Zinc	0.15	0.03	0.10	0.10
Lead	0.25	Trace	0.05	0.05
Titanium	0.01	Trace	0.05	0.05
Nickel	0.01	Trace	0.05	0.05
Aluminum	Remainder	...	Remainder	...

* Averages of about 200 successive furnace melt analyses.

† "As Low As" values are from the same series of analyses.

** These are all maximum values.

All figures are in per cent.

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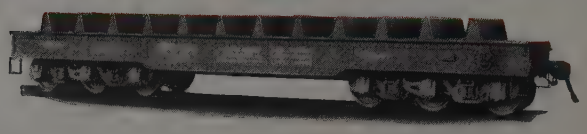
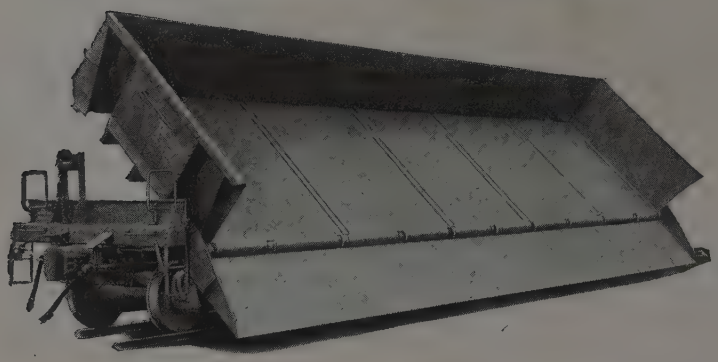
TRADE MARK

STEEL PLANT CARS





PRESSED STEEL CAR COMPANY, INC.
PITTSBURGH, PA.
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MT. VERNON CAR MANUFACTURING DIVISION
Pressed Steel Car Company, Inc.
MT. VERNON, ILLINOIS

out oxidizing, or a large portion of i will be lost in the dross formed. Use o a reducing atmosphere in the Reynold furnaces prevents any such oxidizing o "burning" of even the thinnest metal, yc permits good melting rates.

Principal factors to be controlled dur ing remelting and refining operations ar chemical composition, inclusions and gas Inclusions that may be present in th molten metal may come from dirt, th various oxides of aluminum, and foreig particles. Proper fluxing action will brin practically all inclusions to the surface of the bath where they can be skimmed off. This mechanical action during flux ing will be further explained below.

Molten aluminum has a tendency t dissolve considerable amounts of hydro gen, either between the atoms of alumi num (interstitial) or absorbed by oxide and other inclusions. Gas held by the inclusions is of course removed along with the inclusions during fluxing. The fluxing agent adheres to the inclusions causing their apparent density to become such that the particles rise to the surface of the molten metal where they are re moved by skimming.

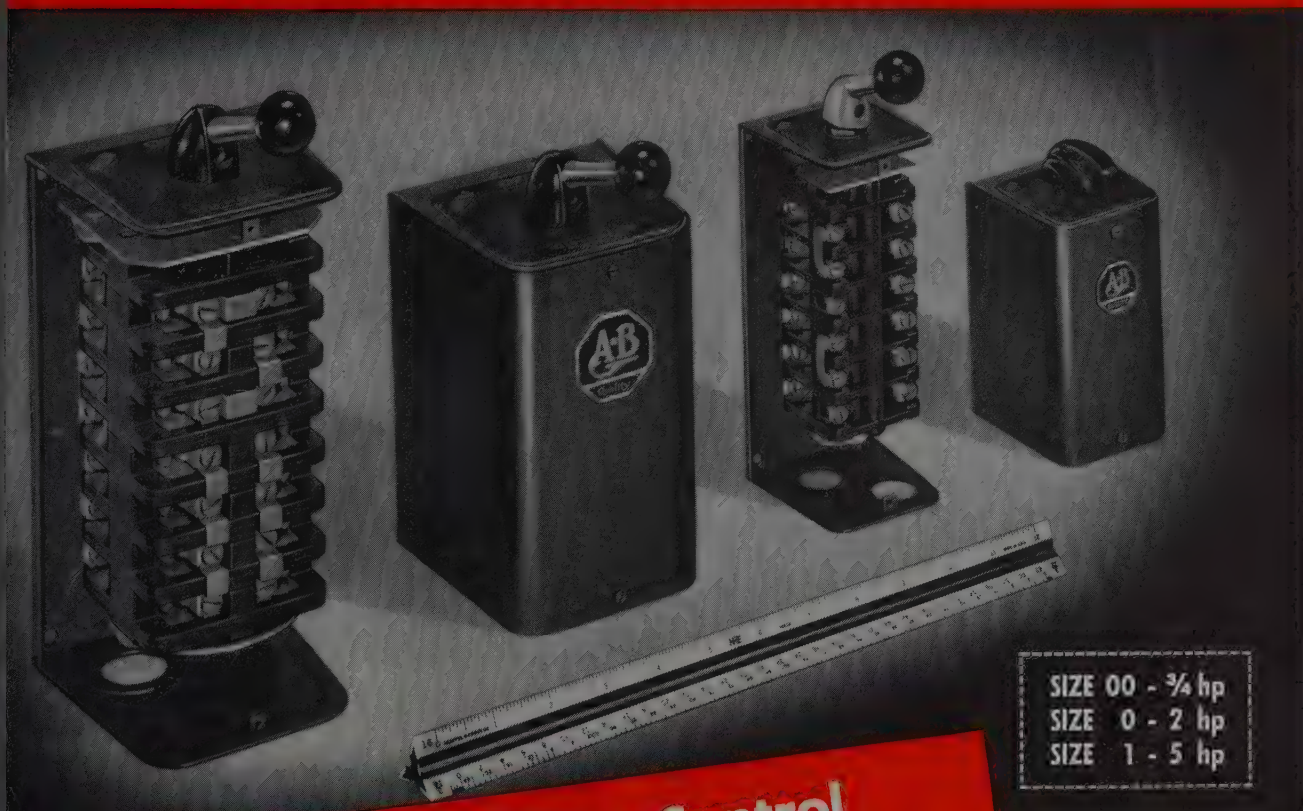
Hydrogen atoms spaced between the aluminum atoms are not so easily re moved. Hydrogen dissolved in aluminum rapidly diffuses to permeate the entire bath.

Gas Removal by Sodiumizing: An effec tive degassing agent for aluminum is metallic sodium. Just how sodium re moves dissolved gas from molten alumi num is not clear. Theory conforming best to actual experience is that the sodium atoms actually replace the hy drogen atoms, the hydrogen escaping into the atmosphere. There is little evi dence to support any chemical reaction theory, although the law of mass action undoubtedly is an important factor.

Actual tests have shown that sodium in amounts from 0.001 to 0.005 per cent effectively removes dissolved gas from aluminum. However, special equipment is required to add it to the bath because of its low melting point (tendency to vaporize and be lost), low specific gravi ty (tendency to float out of the bath) and its limited solubility in molten alu minum at ordinary bath temperatures. In order to allow the sodium to dissolve instead of rise to the surface of the bath the sodium may be placed in a cylin drical container and immersed in the bath. Holes in walls of the container allow the sodium to react with the bath. It should be pointed out that good re melting and refining seldom requires the addition of sodium. Practice at plant 5 does not employ sodiumizing.

When reclaiming aluminum alloys in the heat-treatable classification, it is par ticularly important to provide suitable

Small Cam-Operated
DRUM SWITCHES



SIZE 00 - ¾ hp
SIZE 0 - 2 hp
SIZE 1 - 5 hp

for Multi-Speed Motor Control
Reversing Service
Master or Transfer Switching

An 8-page bulletin is required to describe the great variety of applications and switching combinations of these handy Bulletin 353 cam-operated drum switches. They can be built up to 15 sections, with contacts opening or closing at any point of lever travel. Switching problems can be solved with surprising ease and simplicity. The silver alloy contacts require no cleaning or servicing, because any oxide which may form on the contacts is as good a conductor as the contact metal, itself. There are no sliding contacts . . . the beryllium copper fingers operate with a quick-closing and quick-opening action. Available in three sizes shown above.

Sectional view of Bulletin 353 Drum Switch showing contact sections and central operating shaft with hand lever.

A-B Quality

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

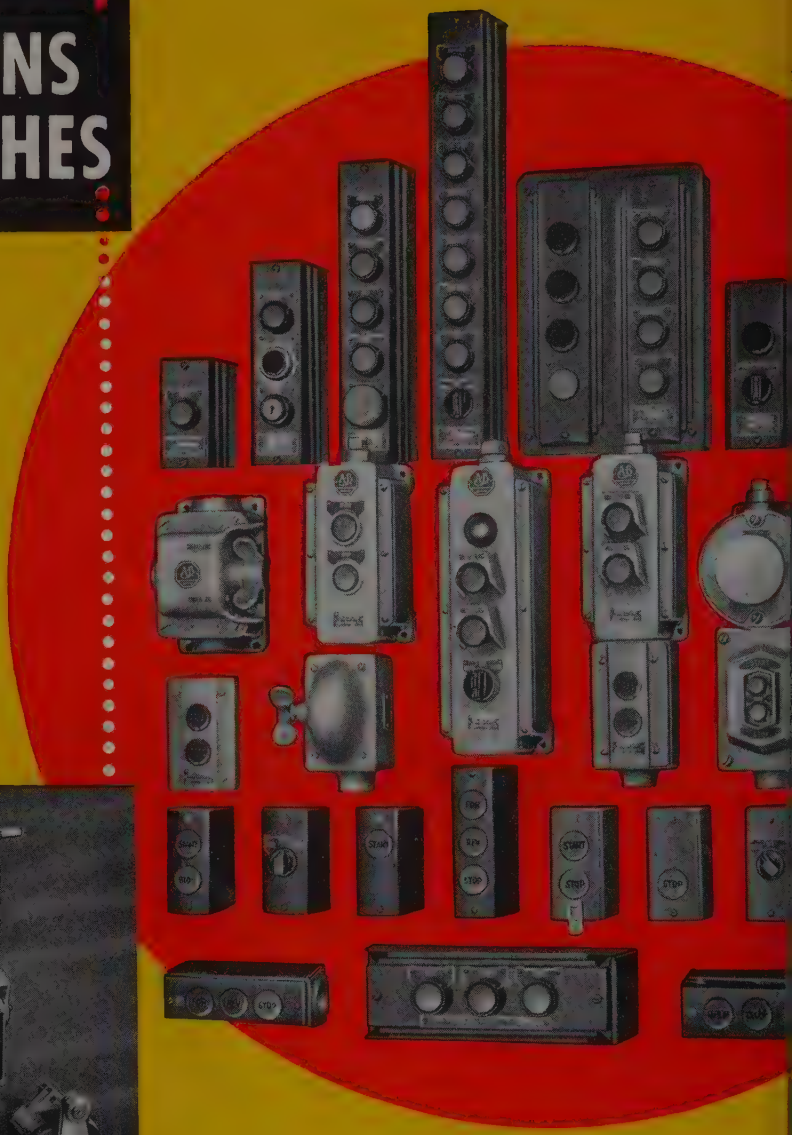
PUSH BUTTONS LIMIT SWITCHES

for

Manual and Automatic Control

If you are designing machines . . . or installing new machines . . . get the most out of them with push buttons or limit switches of the correct type. Added safety can be assured by using extra STOP buttons or perhaps a limit switch. Convenience, speed, and less spoilage are a few other advantages of adequate use of modern pilot control stations.

Limit switches are more than "stop-motion" units . . . they regulate machine speeds during bed travel or automatically put machines through a repeated sequence of operations. Send for Bulletin 801-802 on Allen-Bradley standard, heavy duty, and precision limit switches.



The above illustration shows 25 of the several hundred ty of standard push button stations that are listed in Allen-Brad Bulletin 800. But these few examples will serve to indicatc immense variety of enclosures, button labels, numbers of b tons, and also such auxiliary elements as pilot lights, sele switches, etc., which can be selected from the standard Al Bradley line to fit your needs. If you build or use motori machines, by all means send for Bulletin 800, today.

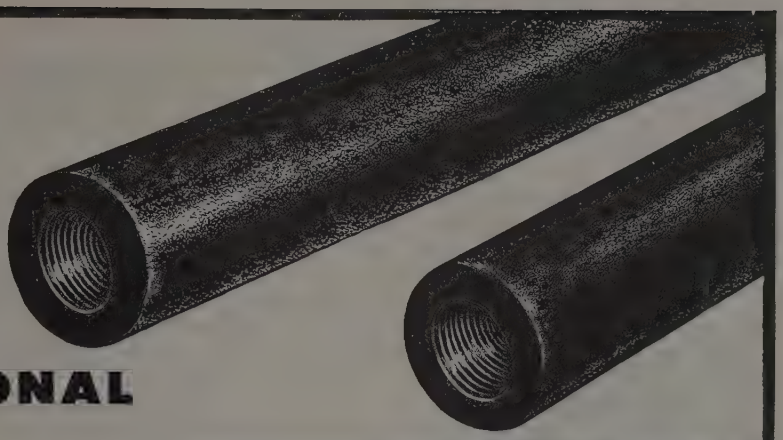
Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, W

A-B Quality

ALLEN-BRADLEY

MOTOR CONTROL

Back of the shovels that move mountains



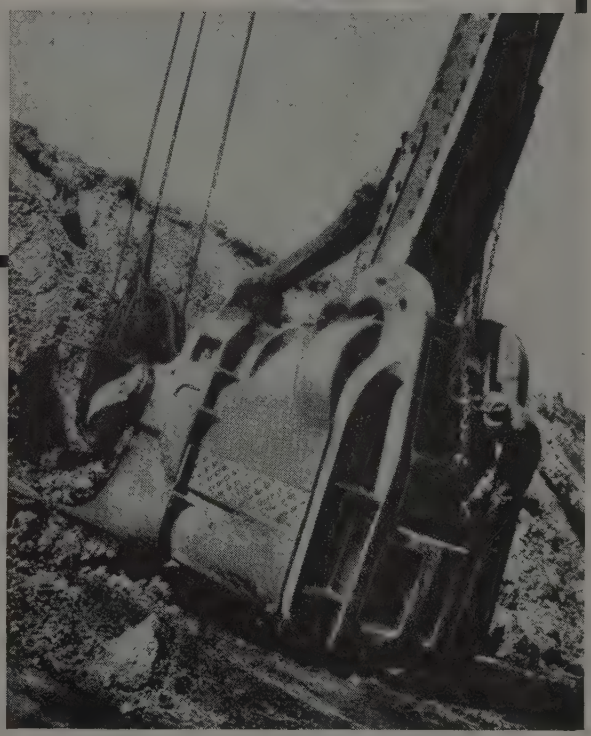
INTERNATIONAL GRAPHITE ELECTRODES

The tough, hard-working steels used in mining and quarrying equipment to combat the relentless attack of hard, abrasive rock often outlast ordinary steels 10-to-1.

Makers of heavy-duty castings used in earth-moving machines—dipper teeth, bucket chains, crawler and conveyor parts—are regular users of International Graphite Electrodes.

In their products there can be no compromise with quality. And they have found, in actual electric furnace operation under a wide range of production requirements, that International Electrodes have what it takes to make the steels that can "take it"—the right physical, electrical and chemical properties in the right combination for their exacting needs.

For all-around satisfaction and economical performance, specify International the next time you buy electrodes. Write for details and prices today.



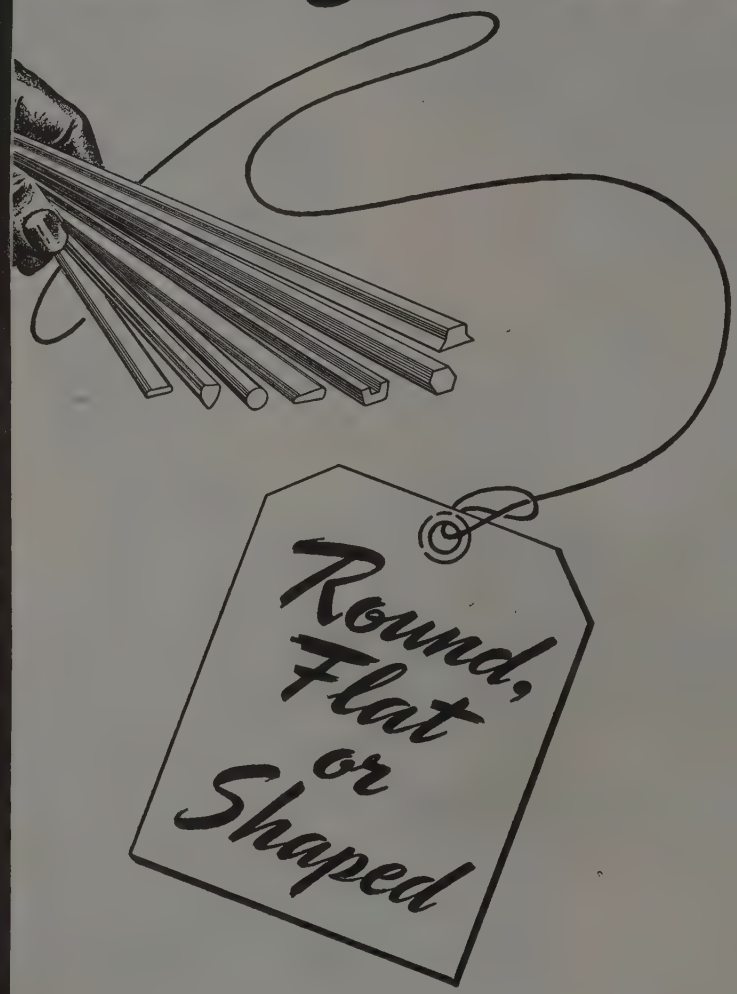
Specify INTERNATIONAL Graphite Electrodes for—Slow consumption—High current capacity—Low rate of oxidation—High thermal conductivity—High degree of purity—Consistently uniform properties and dimensions—Low cost per ton of production.

International Graphite & Electrode Corp.
SAINT MARYS, PA.

IGE

2547

PAGE Stainless Steel WIRE



● It isn't boasting to say that we really know something about stainless steel wire. Wire has always been the business of PAGE. And stainless steel wire has been a PAGE specialty almost since the introduction of stainless.

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

A·C TRADE MARK

stirring action to prevent consistently the occurrence of "off-composition" metal. While one of the most important furnace operations, stirring, is seldom performed correctly.

Yet it is important for several reasons. Proper stirring action is essential if the alloying elements are to be distributed equally throughout the bath, assuring a uniform composition. The sludge and heavy particles of oxide and inclusions that tend to accumulate on the bottom are mixed in with the metal where they can be removed by the fluxing operation. The degassing agent (where used) is distributed throughout the bath, insuring proper degassing action. And finally, stirring equalizes the temperature of the metal throughout the bath.

Use of a relatively large hoe-type tool is recommended, drawing it slowly back and forth across the floor of the hearth. A minimum stirring period of 10 min is usually regarded as absolutely necessary.

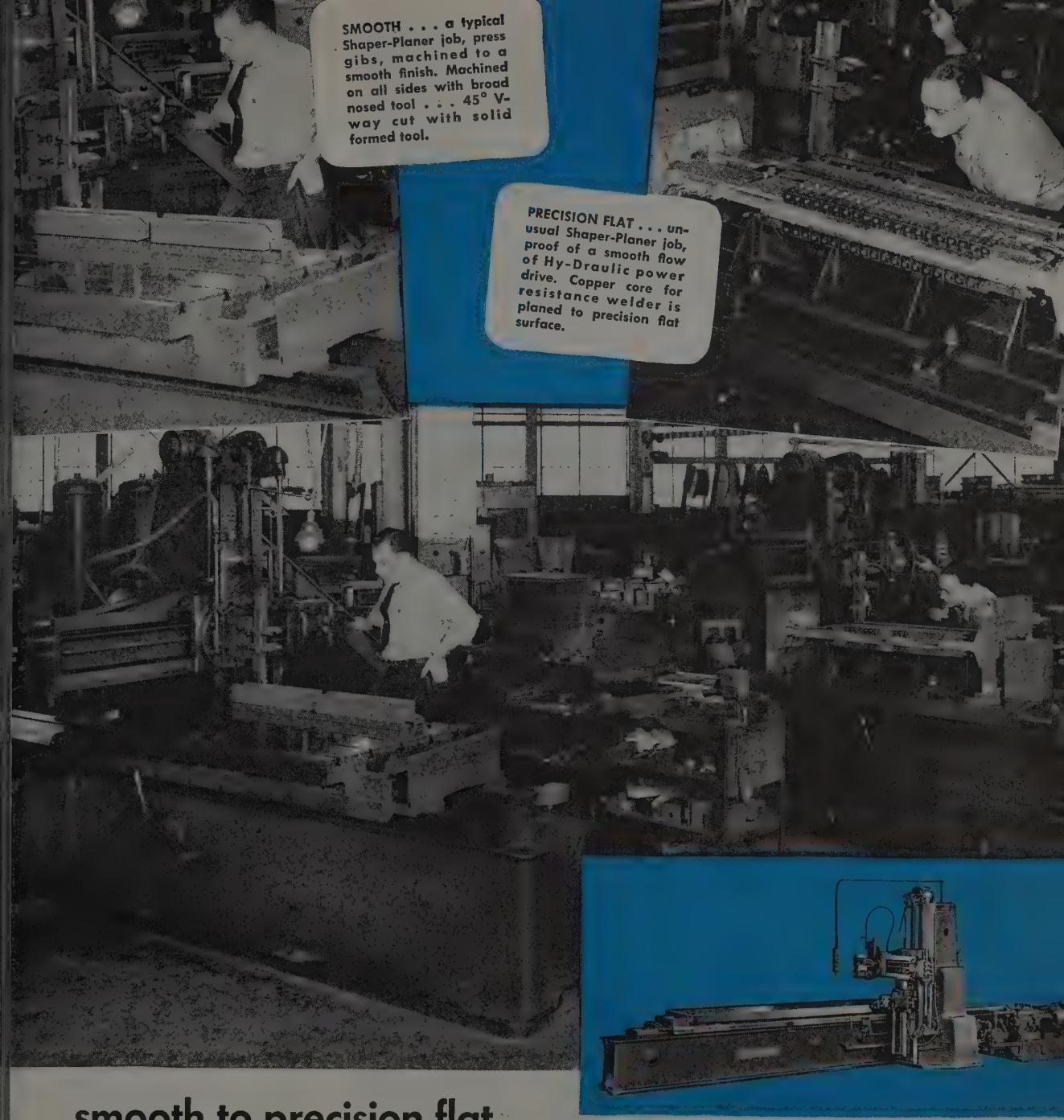
In any fluxing operation, there are a number of factors involved: As previously mentioned, the fluxing agent adheres to the foreign particles, inclusions and oxides that are suspended in the bath, reducing their apparent specific gravity and in turn causing them to rise to the surface of the bath.

Fluxing agent may react chemically with impurities to change them into a form in which they either are harmless or easily removed. The flux may also remove some of the occluded gases, the mechanism of which is not completely understood. (Atomic chlorine may react with the hydrogen to degas the metal, etc.)

Aluminum chloride has been widely used as a flux. However it is expensive and presents a handling and storage problem. Also, equipment must be available to keep the solid flux submerged in the bath while it decomposes. In addition, the time required to properly flux a furnace is substantially greater than when using chlorine or nitrogen.

It is evident that the use of aluminum chloride must be on an intermittent basis, since its reaction is limited to that period from its insertion under the surface of bath (usually employing a perforated metal container), till the point where the decomposition is complete. Also this involves a hand operation.

Continuous Gas Fluxing: If fluxing could be accomplished by the continuous introduction of a gas into the bath, a number of desirable advantages could be obtained. First the mechanical agitation so provided would make manual stirring unnecessary—a valuable feature. Second, it would permit a continuous or nearly continuous remelting and refining cycle, in turn promoting maximum output from



SMOOTH . . . a typical Shaper-Planer job, press gibs, machined to a smooth finish. Machined on all sides with broad nosed tool . . . 45° V-way cut with solid formed tool.

PRECISION FLAT . . . unusual Shaper-Planer job, proof of a smooth flow of Hy-Draulic power drive. Copper core for resistance welder is planed to precision flat surface.

smooth to precision flat

4712

Unusual accuracy of the Rockford Hy-Draulic Shaper-Planer is demonstrated by the above installation. Machining the gibs to a smooth finish is a standard job, typical of the hundreds of small planer jobs that are easily and quickly done on a Shaper-Planer. But machining the copper core of a resistance welder is a most unusual job . . . and proof of the absolute smoothness of the Hy-Draulic cutting stroke. The finish obtained on this work with the Rockford Hy-Draulic Shaper-Planer was a surface that checked precision flat within a tolerance measured in micro-inches . . . the type of finish ordinarily obtained only by high speed carbide milling or by surface grinding. Rockford Hy-Draulic Shaper-Planers are always fast, always easy to set-up. In addition they give you the maximum in work accuracy that only quality machine construction plus the even flow of Hy-Draulic drive can provide. For complete facts write for Bulletin 445.

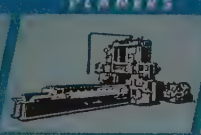
ROCKFORD MACHINE TOOL CO.
ROCKFORD ILLINOIS

1947 MACHINE TOOL SHOW

Hy-Draulic

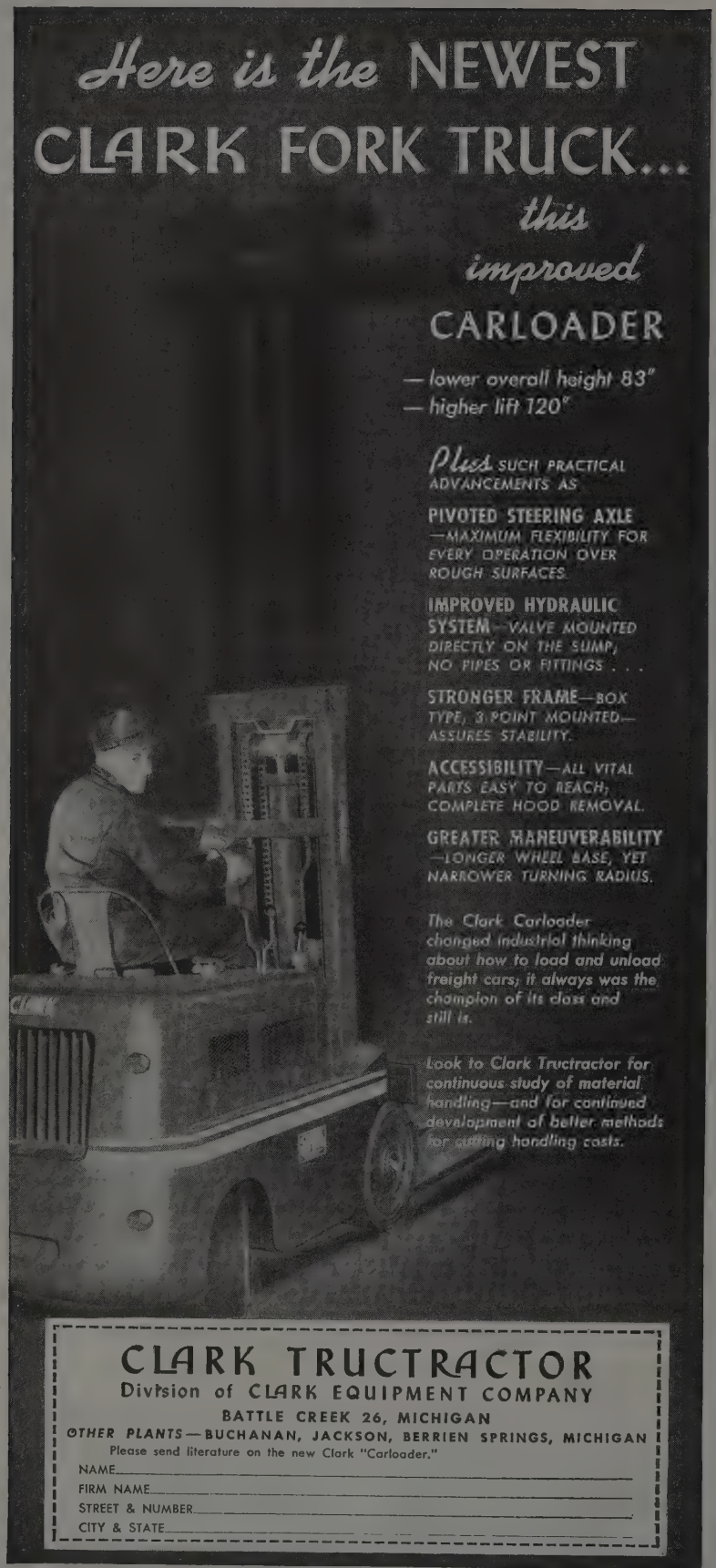
SHAPERS

PLANERS



SLOTTERS

SHAPER-PLANERS


Here is the NEWEST
CLARK FORK TRUCK...
this improved
CARLOADER
— lower overall height 83"
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Plus SUCH PRACTICAL ADVANCEMENTS AS
PIVOTED STEERING AXLE —MAXIMUM FLEXIBILITY FOR EVERY OPERATION OVER ROUGH SURFACES.
IMPROVED HYDRAULIC SYSTEM—VALVE MOUNTED DIRECTLY ON THE SUMP; NO PIPES OR FITTINGS . . .
STRONGER FRAME—BOX TYPE, 3 POINT MOUNTED—ASSURES STABILITY.
ACCESSIBILITY—ALL VITAL PARTS EASY TO REACH; COMPLETE HOOD REMOVAL.
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Please send literature on the new Clark "Carloader."
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the furnaces and other equipment.

Liquid chlorine, purchased in tank car quantities, has been found excellent for continuous fluxing at plant 5. Of course it is gasified before introduction into the bath of molten metal. But before describing the chlorine system and its application here, it may be in order to take a little broader look at the subject of fluxing in reclaiming scrap aluminum.

In general, most fluxes heretofore used in secondary-aluminum practice have been salts of one sort or another. These can be divided according to the principal action involved in their use.

Liquid Covers: Various binary and more complex mixtures of salts rich in calcium chloride or sodium chloride may be used as a liquid (at usual operating temperatures for molten aluminum) to cover the molten bath, preventing oxidation of the metal. Sodium chloride is usually preferred because calcium chloride tends to absorb moisture and cause difficulty from gassing. Fluoride is added to increase the ability of the flux to dissolve aluminum oxide.

Such liquid covers are used in pot and furnace melting operations where the scrap may be baled and melted underneath the surface of the bath, the flux cover preventing oxidation of the molten aluminum surface by excluding air or furnace atmosphere. Other materials sometimes used alone or in combination for liquid covers include borax, cryolite, calcium fluorite, etc.

Chemical fluxes dissolve aluminum oxide from the molten globules of aluminum, hence promote coalescence. Such fluxes usually contain calcium fluoride or cryolite with an inexpensive chloride. Mixtures of the fluoride salts corresponding to welding flux mixtures are too costly for use in secondary aluminum operations because of the lithium compounds they usually contain.

Fluoride fluxes exert a positive solvent action on aluminum oxide and also liberate fluorine which attacks silicates and dirt. Chemical fluxes may also exert a mechanical action like volatile fluxes in that their decomposition in the bath may set free gases that tend to force suspended matter to the surface.

Volatile fluxes are a class that dissociate at or below normal bath temperatures. They are used to effect separation of suspended impurities largely by the mechanical action of the gases evolved when the flux is introduced far down in the body of the molten metal. The resulting stirring action is beneficial, the gas carrying with it any particles of matter suspended in the bath as it rises to the surface.

Commonly used salts for this class of fluxes include aluminum chloride, ammonium chloride, magnesium chloride,

NOW! the New Shafer Standard Duty Pillow Blocks

with the DOUBLE EXTENDED INNER RACE

and the Z HOUSING SEAL

and the PRE-ADJUSTED DOUBLE ROW BEARING ASSEMBLY

and the NEW STRUCTURAL STURDINESS

In its program of constant bearing progress, Shafer has redesigned its line of Standard Duty Pillow Blocks for far more efficient bearing performance.

Now the inner race extends on *both* sides of the bearing . . . increasing the length 40 to 90% . . . correspondingly decreasing the per unit area shaft pressure, wear and any tendency to mechanical fretting. The collar locking set screws firmly force the shaft against the race on the side opposite the set screws, reducing any tendency to pound or whip. The set screws hold under constant tension and don't work loose under severe operation.

Despite the increased race length, the total length is less and this more compact design allows gears, pulleys, etc. to be mounted closer to the bearing and reduces shaft stresses.

The housing has more rugged buttressed construction. The pillow block is available in 2 bolt and 4 bolt models and is interchangeable with previous designs.

Another feature is the new and already famous Shafer Z Radial Float Roller Bearing Housing Seal which more efficiently than any other seal keeps dirt out and grease in.

The Standard Duty Pillow Block also embodies the famous Shafer self-aligning radial-thrust, pre-adjusted double row roller bearing.

There is no other Standard Duty Pillow Block that offers these features and this degree of performance. Try this new Shafer Pillow Block and see for yourself. SHAFER BEARING CORPORATION, General Offices: Chicago 7, Illinois.

SHAFER CONCAVEX SELF-ALIGNING BEARINGS

WRITE FOR FREE DESCRIPTIVE BULLETIN ZXX1

SPOT FIRE
STOP FIRE
All in Seconds....
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Record or blueprint vaults, fur vaults, flammable liquid stores, material supply rooms and other areas where constant attendance is not feasible are made safe from fire with C-O-Two. A C-O-Two Smoke Detecting System (approved by Underwriters' Laboratories) continually draws air from the protected space, picks up the first thread of smoke and immediately sounds the alarm. Then the C-O-Two automatic fire extinguishing system swings into action, pouring cold, dry, carbon dioxide gas into the space. The fire is out in seconds after it began.
Two or more spaces may be protected with one C-O-Two system; a directional valve releases clouds of carbon dioxide gas into the threatened area. Doors, windows and ventilators may be closed and machinery cut off by pressure-operated releases operated by the system.
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sodium silicofluoride, and zinc chloride. Such fluxes are also added to the surface of the bath to help detach the molten aluminum in the dross or skim from the admixed oxides and dirt, producing a dry powdery dross containing little aluminum. Zinc chloride is particularly useful for this purpose.

Oxidizing fluxes sometimes called "refining" fluxes, assist in the removal of impurities by liberating free oxygen in the bath which bubbles to the surface, carrying with it any particles suspended in the bath—an action similar to that of the volatile fluxes.

Suitable materials in this classification include the bichromates of the alkali metals (sodium and potassium), ammonium bichromate, sodium chlorate, potassium chlorate, heavy metal nitrates, and permanganates. The alkali nitrates are not suitable because reduction of these salts leaves a metal harmfully affecting the mechanical properties of the aluminum.

The "Ideal" Flux: If all the properties desirable in a flux were to be listed, they would probably include most of the following points: An ideal flux would possess the power to dissolve or absorb aluminum oxide, dirt and silicates, reduce surface tension of liquid aluminum globules; should separate cleanly from the metal; have a low dissolution temperature and a melting point below that of aluminum. Also it should be nonpoisonous, low in cost, and have a lower density than aluminum.

It should not be viscous in the liquid state, nor should it volatilize unduly at the melting temperature. Neither should it react with the container or furnace structure, nor should it contaminate the aluminum or deteriorate on standing.

While many fluxes have been suggested and used at times, only a comparatively few have much practical value. Even the best of them possess only a few of the above ideal qualifications.

(To be concluded next week)

Electric Arc Furnace

(Continued from Page 107)

on the opposite side of the rack. The Rototrol regulators not needing the amplifying generator are small enough so they may be mounted in a cabinet of which the operator's control panel is the front.

The electrical connections to the motor-generator sets are made through plugs and jacks. (See Fig. 2). The Rototrol field circuits, as well as the armature circuits, are carried on short flexible cables between the fabricated steel frame and the generator jack. Disconnecting a generator is simplified to opening a single plug block. Four bolts are used to hold

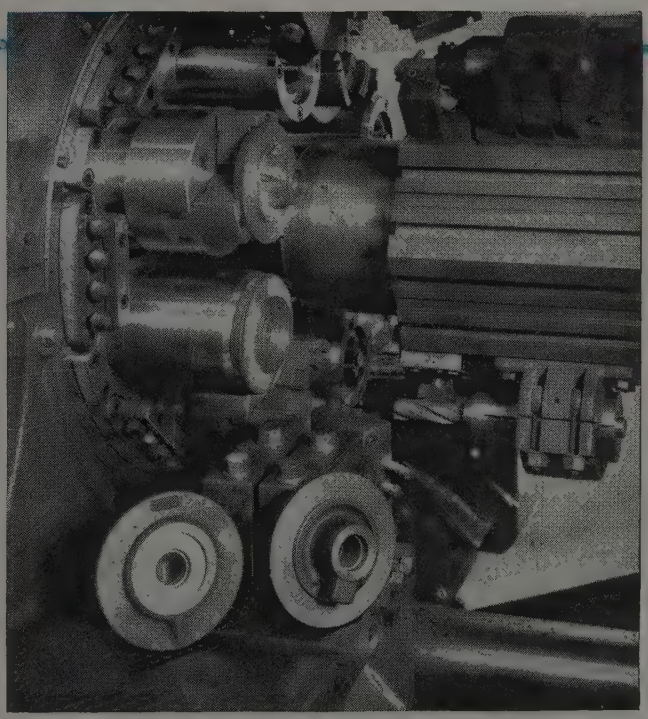
Can you use a "SECOND-STRETCHER"?

That's a machine that does as much work in one second as other machines do in 2 or 3 seconds.

National Acme offers industry a wide range of these modern multi spindle Acme-Gridley Automatics—both bar and chucking types.

They are all designed to help you keep production costs low in spite of advancing wage rates and higher prices for raw materials.

We'd like to discuss with you the application of up-to-date, long-run production methods of Acme-Gridleys on work in your plant.



You might have this kind of job to produce

Here is a case that proves the point, selected from many thousands on which we have records.

This 5″ flange starts with a Meehanite casting. A 6″ RPA, 8 spindle Acme-Gridley Chucker finishes both ends, with two sets of tools, double index, pieces loaded in alternate positions.

There are 9 operations on the small end, 6 operations on the large end, a total of 15 operations, completed in 31 seconds per piece—116 pieces per hour machine time.

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS
Maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.

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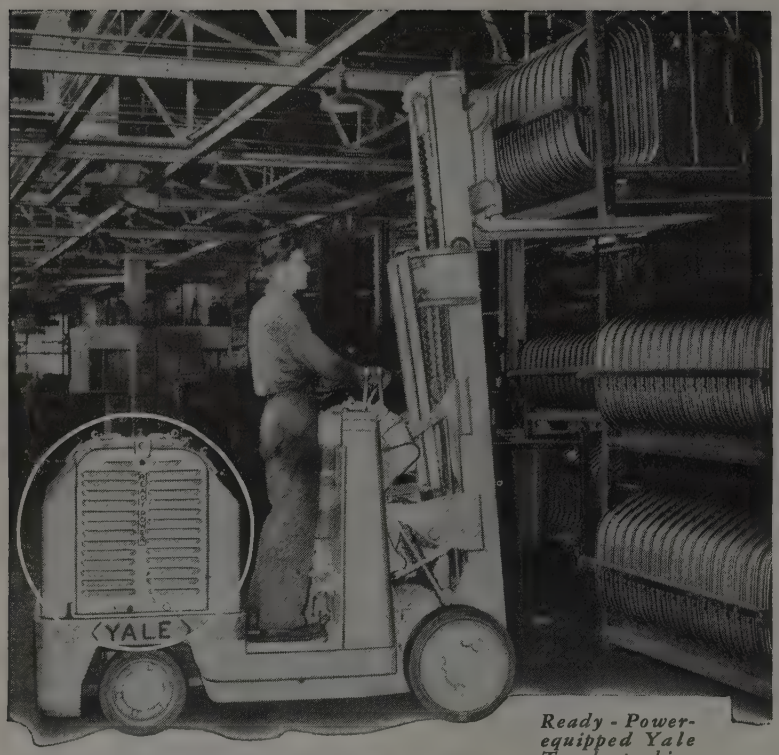


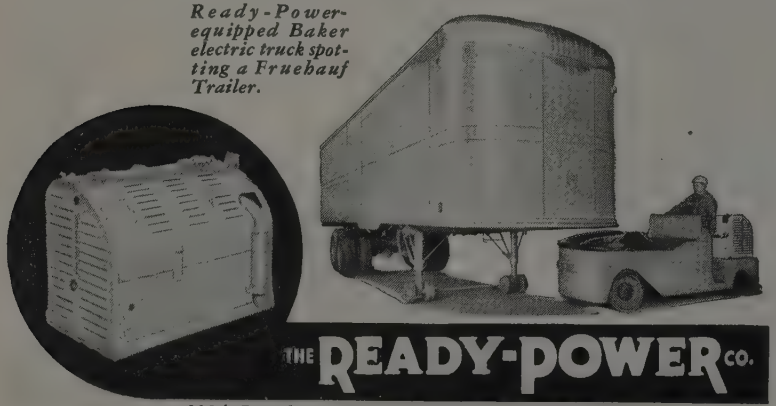
Ready - Power-equipped Yale Truck, stacking automobile parts.

power unlimited

WITH READY-POWER

There's a world of power in Ready-Power-equipped electric trucks and it's yours in any amounts needed to handle your jobs with utmost efficiency. Ready-Power gas-electric Units generate dependable electric current, in unlimited amounts, right on the truck chassis. Keep them working as many hours as you want. They won't slow down. Equip any make truck with Ready-Power.

Ready-Power-equipped Baker electric truck spotting a Fruehauf Trailer.



THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

the Rototrol in the frame. However, a longer flexible cable may be supplied for a spare unit so that it can be put into service without being placed in the frame.

Complementing and implementing the mechanical ease of replacement is the electrical design. The generator circuit adjustments are external to the generator proper. Resistors and rectifiers are mounted on the panel on which the flexible cables to the generator terminate. The generator components are designed broad enough so that the unavoidable manufacturing differences in air gaps, brush settings and field and armature resistances are not critical. Accordingly, since the adjustments of the Rototrol identifying it with a particular furnace are not within the generator proper, all generators of a similar size are interchangeable.

Adjusting a Rototrol to a particular furnace consists of matching the electrical characteristics of the regulator to the physical characteristics of the electrode positioning system. The electrical inertia must be made to approach the mechanical inertia. Independent control of each nace are not within the generator proper, matching. This is made possible by having all circuits, detecting as well as amplifying, accessible to adjustment. The adjustments are made on tapped and sliding contact resistors.

Variation of heat input into the furnace, after selection of a suitable furnace transformer voltage, is obtained by current adjusting rheostats. These are connected in parallel with the current-transformer secondaries and provide full sensitivity over the entire range of adjustment. Shunting the current-transformer secondary current through a variable resistor provides a range of adjustment in the electrode from full load to 20 per cent of full load.

Maximum current available to the electrode is determined by the furnace transformer, however, the maximum available electrode current usually does not coincide with maximum furnace heat input. Operating a furnace at current values beyond the point at which maximum power input occurs will result in a decreased circuit power factor. Adjustment of electrode current through the use of the current adjusting rheostats provides the operator with the means for setting the proper electrode current where the real power input and, therefore, heating effect is a maximum.

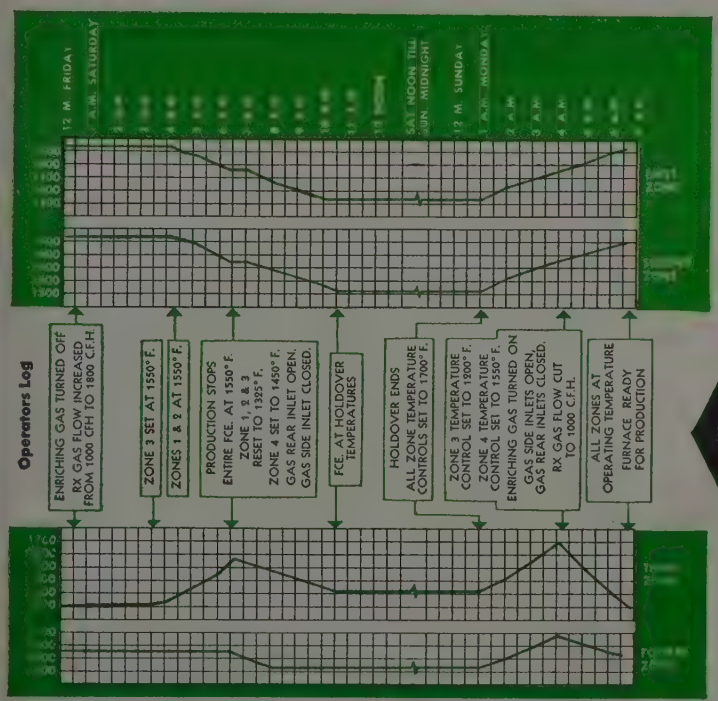
In service, the Rototrol has proved itself adequate to the application. Extensive tests have been made to show its suitability and to compare it with its predecessor, the balanced beam regulator. Modifications and improvements resulting from these tests have produced a superior type of regulating equipment as shown by performance comparisons.

suspended carburization

SAVES UP TO 24 PRODUCTION HOURS PER WEEK

Restarting a continuous carburizing furnace after a week-end shutdown normally wasted up to 24 hours of production time in a large automotive plant. This costly loss of both time and furnace capacity has now been eliminated.

The engineers of Surface Combustion Corporation working with those of the manufacturer developed a procedure whereby the charge in the furnace is now held over the shutdown period at somewhat less than normal temperature, but under non-carburizing conditions and keeping the metallurgical structure of the charge within commercial limits. Note the typical operating log shown here.


12 M. FRIDAY
A.M. SATURDAY
SAT. NOON TILL SUN. MIDNIGHT
12 M. SUNDAY
A.M. MONDAY
2 A.M.
3 A.M.
4 A.M.
Operators Log
ENRICHING GAS TURNED OFF. RX GAS FLOW INCREASED FROM 1000 C.F.H. TO 1800 C.F.H.
ZONE 3 SET AT 1550° F.
ZONES 1 & 2 AT 1550° F.
PRODUCTION STOPS ENTIRE FCE. AT 1550° F. ZONE 1, 2 & 3 RESET TO 1525° F. ZONE 4 SET TO 1450° F. GAS REAR INLET OPEN. GAS SIDE INLET CLOSED.
FCE. AT HOLDOVER TEMPERATURES
HOLDOVER ENDS ALL ZONE TEMPERATURE CONTROLS SET TO 1700° F.
ZONE 3 TEMPERATURE CONTROL SET TO 1700° F.
ZONE 4 TEMPERATURE CONTROL SET TO 1550° F.
ENRICHING GAS TURNED ON GAS SIDE INLETS OPEN. GAS REAR INLETS CLOSED. RX GAS FLOW CUT TO 1000 C.F.H.
ALL ZONES AT OPERATING TEMPERATURE FURNACE READY FOR PRODUCTION

TIME-TEMPERATURE CYCLE for SUSPENDED CARBURIZATION

This is accomplished by careful manipulation of zone temperatures and the use of RX gas (Dew Point Control) under very close control. When the furnace is restarted Monday morning, it takes only a few minutes to re-establish the carburizing cycle—raising the unit to operating temperature is no problem.

Ask for suggestions on how your continuous furnaces may be handled to avoid week-end shutdown losses.

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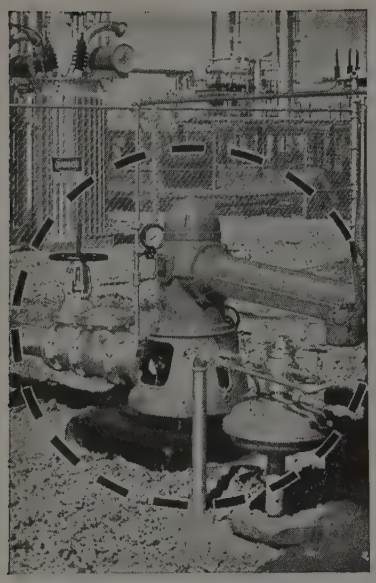

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To you, the reader, the above picture is just one of hundreds of Layne Well Water Systems that are now serving oil fields, refineries and pumping stations. But to us, it is a symbol of approval by one of the world's largest and most important industries. Furthermore, this picture serves to symbolize a record of nearly seventy years of successfully matching the highest quality materials with honest craftsmanship.

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Cutting-Off

(*Concluded from Page* 94)

chines which will cut high speed steel bars, hardened steel rods and various other unmachineable material. These machines are close relatives of the disk machines which with the help of water and sand are used to saw stone by means of metal disks without teeth other than supplied by the sand grains.

Just as grinding machines did not come into wide use until artificial abrasives and scientific bonding were developed, so also can it be said that abrasive cutting off of metal now really is coming into its own with improvement of thin wheels of artificial abrasive strongly bonded by materials such as plastics which can stand the gaff of the heavy service demanded. Under such service, old-fashioned wheels would have gone to pieces like china saucers. Recent designs stand up almost like metal disks.

One thing which has added much to popularity of abrasive disk cutting off, is improvement in dust and fume exhaust systems. Time was when one cut on a high speed steel rod announced itself throughout the shop by its distinctive aroma. Today the aroma—if any—is propelled into the great open spaces outdoors where it annoys no sensitive noses.

Since the invention of the automatic screw machine by Christopher Miner Spencer in 1873, the cutting off of revolving bar stock by single point, narrow blades has been one of the production bottlenecks. Mr. Spencer told me that he tried all sorts of methods to speed up and improve this "longest single operation", without notable success. However, he did not feel so badly about it when he observed that in the ensuing 50 years, no other inventor had much more success than he did in improving the technique. Obviously, it is mighty tough on a narrow tool working deep down in a slot—especially when the work begins to wabble.

The biggest boon to blade cutting off seems to have come with the development of tungsten carbide tipped cutting off blades. Another help is the increasing use of tubing instead of solid stock in screw machines. As an old-time automatic man, however, I still believe that young tool engineers have a wide open field for ingenuity in improvement of blade cutting off tools and technique of their use. One of them is going to surprise us one of these days with a real development in that direction—on which he will deserve to make some real money. That goes for both work-revolving and tool-revolving operations.

A few weeks ago I dropped in to see our neighbor Oskar Kylin, vice president and chief engineer of Bardons & Oliver Inc., whose machine tool plant is less than 10 minutes walk from my office. Mr. Kylin showed me how he has licked the problem of cutting off pipe and tubing in a fast automatic designed primarily for that purpose. He uses a knife-edged disk like that of an oversize glass cutter. This is free to revolve on a husky pin and when pressed into the tubing, it "incises" it off in "nothing flat". No chip is taken and very little burr is raised in the bore. Like many ingenious systems, this one is notable for simplicity. There is no waste because there is no kerf. That also means something in these days of high costs.

The trend today in cutting-off operations on high production work, is definitely in the direction of automatic cycles, both of stock feeding and in co-ordinated operation of the machine itself. In other words, the operator loads the machine, presses a button, and the machine goes on cutting and feeding until the bar—or bundle of bars in some cases—is all cut up. Thus pace is kept with chucking machines and other machines in the line. Incidentally, this technique helped shell production tremendously during the war.

Two of the heavy duty machines illustrated in this article can be set up as "automatics" and the machine illustrated in the heading of this story actually is so set up. Properly speaking, this is not primarily a cutting-off machine at all. It is an automatic milling machine built by U. S. Tool Co. Inc., Ampere, N. J., for a wide variety of high production operations.

In this particular case it has been tooled up as a highly efficient, precision, automatic cutting-off machine with multiple cutters. Its hydraulic feed slide is timed to feed the bar into the hydraulic chuck to exact length—during return stroke of the table. As the bar feeds in, it ejects into the chute the seven identical parts produced during the previous cycle. The hydraulic vise then closes and the cutting cycle is carried out.

Time was when tooling involved only some rule-of-thumb metallurgical knowledge plus similar empirical knowledge of cutting action of tools. Today all that rule-of-thumb stuff is "out". Nowhere is that more true than in the case of cutting-off operations. They involve real machine tool engineering and real tool engineering. He who believes otherwise is out of step with the times.

—o—

Soil and smudges may be easily washed off the plastic coated drawing board cover paper produced by Charles Bruning Co. Inc., 4700 Montrose avenue, Chicago 41. It lies flat without curling, and its green color minimizes glare and reflection.

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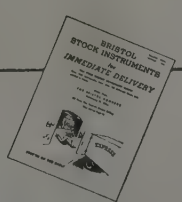
Write for Stock Instrument Bulletin No. W1811. The Bristol Company, 105 Bristol Road, Waterbury 91, Conn. (The Bristol Co. of Canada, Ltd., Toronto, Ont., Bristol's Instrument Co., Ltd., London N.W. 10, Eng.)



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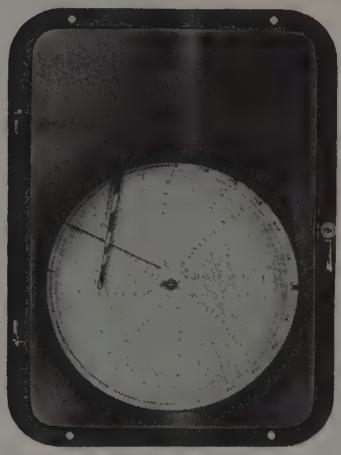

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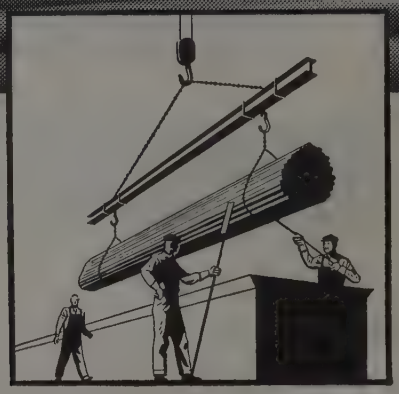

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New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 134

1. Fork Truck Scoop

An accessory designed to speed handling of bulk materials is announced by Service Caster & Truck Corp., Albion, Mich., for its Motowlift fork lift truck. The device, which features an air cushion shock absorber to prevent the scoop from slamming down on the mast, is all steel welded and may be attached to the fork carriage in 5 min.

Capacity of the scoop is 10 to 17 cu ft. It has a replaceable blade. Fork

carriage of truck is designed for interchange from standard pallet forks to other types and special accessories such as the scoop.

2. Silver Brazing Paste

Carbide tool tips may be brazed to steel shanks using Nu-Braze silver alloy diffusion paste No. 50, developed by Sherman & Co., 197 Canal street, New York 13. Flux contained in the paste begins to melt at 480°F and protects both the carbide tip and the steel joint area with a liquid protective film before the heat-generated oxides can form.

3. Roll Selector

Inexpensive, 100 per cent inspection of length and diameter of small precision parts such as roller bearings, dowel pins, chain links, etc., is possible with the automatic hopper-fed roll selector developed by Sheffield Corp., Dayton, O. Adjustment permits an infinite number of different sizes of parts within capacity of machine to be gaged quickly to a tolerance of 0.0005-in.

Parts varying from 7/32 to 31/32-in. on diameters and from 9/32 to 3 in. on lengths may be gaged. Only a brief time is required to change from one setup to another. After setting up the selector, using minimum and maximum masters or two parts known to be the correct size, parts are placed in the hopper. All of the hopper or feed rails that contact the parts are made of proper material to prevent the parts from congesting due to residual magnetism.

Segregation of parts is into four classifications—parts within tolerance limits, diameter within tolerance limits and length oversize, oversize on diameter and undersize on either or both diameter and length. Chutes are used to pass segre-

gated parts into separate bins, classification being at the rate of 3600 parts per hour.

4. Welding Tip Cleaners

Wypo tip cleaners for cleaning oxyacetylene welding and cutting tips, are offered by Air Reduction Sales Co., 60 East 42nd street, New York 17. Cleaners are available in two individual packages. Set No. 1 contains 12 cleaners for drill sizes ranging from No. 75 to 49. Set No. 2 includes nine cleaners for drill sizes from No. 48 to 30.

5. Hand Truck Attachment

Hand trucking of heavy loads is possible with the universal tilt truck attachment developed by Melooz Mfg. Co., 1311 West Washington boulevard, Los Angeles. Attachment takes the load strain off the operator and doubles the carrying capacity of any hand truck.

Free steering, the attachment is readily fitted to both new and old two-wheeled hand trucks. It is made in two sizes, rolling the load on three wheels instead of two. Attachment is instantly adjusted to any desired load balance and full lowered position makes a three wheel platform of the truck.

6. Electrode Holder

Filling the requirements of the job shop or maintenance welder using 200 amp welding equipment, the A-316 Twecotong electrode holder, made by Tweco Products Co., P. O. Box 666, Wichita 1, Kans., is light, compact and has a 95 lb bite on a 3/16-in. electrode. Tip and body insulation is molded laminated glass cloth bakelite. Insulated spring is neoprene covered. Cable connection is a clamp plus a socket for soldering when desired.

7. Thread Rolling Attachment

Straight threads may be rolled rapidly and economically with the Lanroll attachment developed by Landis Machine Co., Waynesboro, Pa., for application to

practically all standard makes of automatic screw machines and turret lathes. It provides for processing threads which otherwise would have to be handled as a secondary operation as a result of shoulder interference or inaccessible positions for threading in normal manner.

Attachment is engineered in accordance with tool slide movements, adjustments, etc. as shown in machine maker's manuals. Rate of penetration is based on the number of product turns in relation to the amount of tool slide movement to complete penetration, so that these values change according to roll diameter, product diameter and depth of

thread. The attachment utilizes a two-roll design with rolls of largest possible diameter in relation to the thread size and pitch. Thread lengths which may be rolled are limited to 1½ times the thread diameter.

8. Medium Flow Pump

With pumping mechanism components fabricated from corrosion resisting materials to suit the type of liquid pumped, the new No. 4702 pump introduced by Candler-Hill Corp., division of Titan Pump & Engineering Corp., Detroit, will handle a variety of fluids in the medium flow and pressure field.

Its rotating impeller is designed to "hydraulically float" in the housing,

assuring long life with little loss of flow or discharge pressure, as there is no metal-to-metal contact between rotating and stationary parts. Pumping water at room temperature, the capacity of the standard production unit at 0 psi discharge pressure is approximately 100 gph. In a general application where 100 psi discharge pressure is required, flow is from 50 to 60 gph. This performance requires a shaft speed of 3450 rpm.

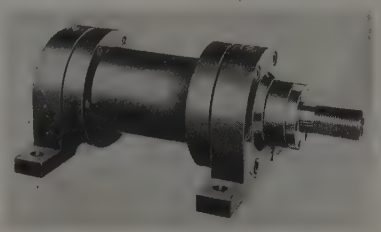
9. Unloading Pump

An unloading pump of the hydraulic gear type—essentially two pumps within a single housing—is a development of Pesco Products Division of Borg-Warner Corp., 310 South Michigan avenue, Chicago 4. A pilot valve which is an integral part of the pump assembly controls an opening in the passage communicating from the outlet port to the rear of the movable bearings in the cover of the pump. When a specified pressure is reached in the system, the pilot valve closes, eliminating the pressure loading.

Pressure in the gear teeth area forces the cover bearings away from the gears and a large section of the pump ceases to deliver fluid. A small section continues to deliver fluid, keeping the system alive. As system pressure falls to the lower limit at which the pilot valve is set, this valve opens the communicating passage and pressure is exerted on the rear of the floating bearings.

10. Hydraulic Cylinders

Hydraulic cylinders incorporating cylinder heads flame cut and machined from steel mill plate are announced by Lindberg Engineering Co., Air and Hydraulic

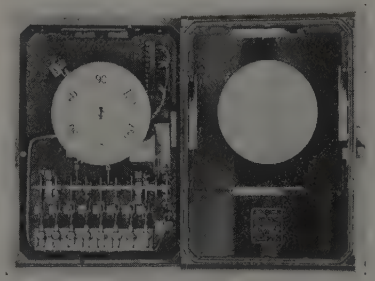


Division, 2444 West Hubbard street, Chicago 12. Ports may be quickly repositioned to suit particular applications, permitting simplified piping.

Caps, flanges, cylinder tubes piston rods and C-rings of all-steel construction reduce breakage. Pistons are aluminum alloy. Step seal piston rings insure a more perfect seal. Neoprene O-rings are incorporated in design, their sealing action being automatic, the higher the pressure, the tighter the seal. Cylinders are manufactured to operate at 1500 psi working pressure.

11. Time Cycle Controller

Designed for use on plant processes where a number of factors must be accurately timed according to a fixed program, the model C500 impulse-sequence cycle controller, made by Bristol Co.,



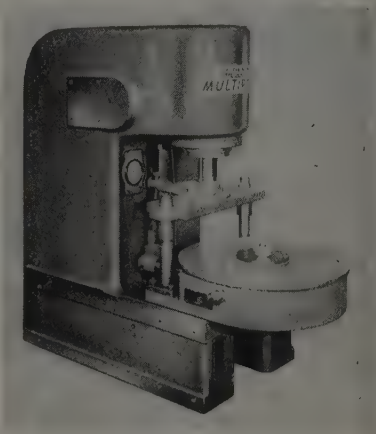
Waterbury, 91, Conn., works on the multiple cam principle. In operation it engages or actuates, at exactly the correct time in each cycle, the necessary mechanical, electrical, or pneumatic devices for automatically carrying out the intended schedule.

Time measurement and pilot valve operations are handled by separate mechanisms. Separation of these functions made possible a design that gives accurate timing of the factors under control, high speed and torque for pilot valve operation and flexibility of application.

Timing is accomplished by a Telechron-driven aluminum disk on which is printed a 25-in. time scale. Scheduled operations are incorporated into the controller by cutting notches on the scale. Time impulses are transmitted electrically. Cams of the unit are individually adjustable.

12. Press Feed Table

Faster, more efficient feeding of small parts to the pressing station is possible with the dial feed table, an accessory to the Multipress both of which are made



by Denison Engineering Co., 1160 Dublin road, Columbus 16, O. Dial feed provides a mechanical type of operation with the dial being actuated with each retracting stroke of the press ram.

Adjustment of the actuator changes the ram stroke to provide either 8, 12 or 24 indexes per dial revolution. Provision has been made for ejection of finished parts beneath the table by removing a section of the table casting. Ejection station is located 120 degrees in a clockwise direction from the pressing station.

13. Air Control Valves

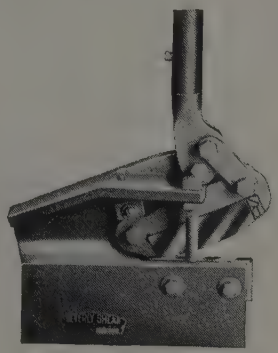
Sliding piston type construction, eliminating valve seats and rod packing is incorporated into the redesigned line of 79 air control valves announced by Logansport Machine Co, Inc., Logansport, Ind. Manual, toggle, foot, cam and light duty direct-operated valves are included in the line along with electric (direct), bleeder and pilot pressure-type remote operated valves.

Foot and manifold mountings are available in the manual, cam and electric operated valves. Manual operated

valves are also made with a flange mounting. Hand operated valves have universal handles, independent of valve mechanism. Because parts of manual valves are interchangeable, these valves may be quickly reconverted for other uses. All valves are designed for operation at pressures to 150 psi.

14. Slitting Shear

Of all steel welded construction and blades made of tool steel tempered and drawn and adjustable, the S-3 slitting shear, announced by Beverly Shear Mfg. Co., 3004 West 111th street, Chicago 43, has an unusual method of power transmission which is smooth and power-



ful. It has an adjustable shoe at the back of the upper blade holder.

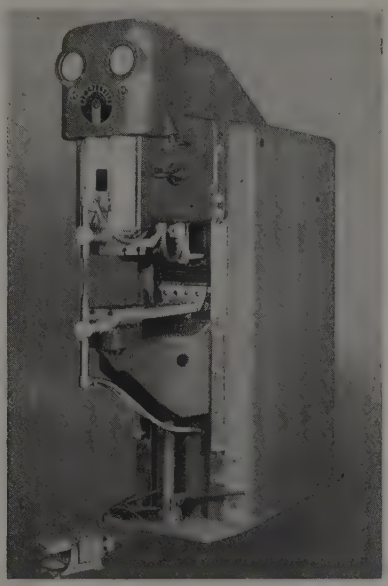
Hand lever operated through a 30-in. handle, the shear has a slitting capacity of 1/8-in. mild steel, a trimming capaciy of 3/16-in. mild steel and a bar capacity of 1/4 x 2 in. mild steel. When equipped with special blades, 10 gage stainless steel may be cut.

15. Spot, Projection Welders

Roller head, press type spot and projection welders, ranging in capacity from 50 to 500 kva, are announced by Progressive Welder Co., 3050 East Outer Drive, Detroit 12. Welders are adapted to continuous high production runs and to handling various types and sizes of work on a job-lot run basis. Provision may be made for pulsation welding, resistance upsetting and resistance brazing, as well as for preheating, postheating or tempering of the work while still in the machine.

A new method of frame construction has made this versatility possible. Designed in two sections, the forward section of the frame which takes all of the stresses incident to resistance welding with high pressures, is of massive construction, heavily reinforced and braced. Head, knee, platens and arms are attached to this section. Rear section of the frame is of relatively light weight construction, actually being a removable sheet metal enclosure. Interior of machine is completely accessible for work to be done on controls, electrical connections, etc.

Hydraulic exclusively on the larger machines, operation is obtained either



by air or hydraulic actuation on all sizes up to 250 kva. Throat depths for projection welding are 18, 24 or 30 in. and for spot welding, 18 or 36 in.

16. Narrow Beam Floodlight

High efficiency illumination is provided by the type L-69 narrow-beam floodlight developed by General Electric Co., Schenectady 5, N. Y., in applications requiring concentrated light beams. It has a light spread of approxi-

FOR MORE INFORMATION

on products and equipment described in this section, fill in a card following page 134.

mately 20 degrees. Features are rifle-like sighting devices, impact resistant spun-on front glass and graduated scales. The floodlight also can be relamped from the rear.

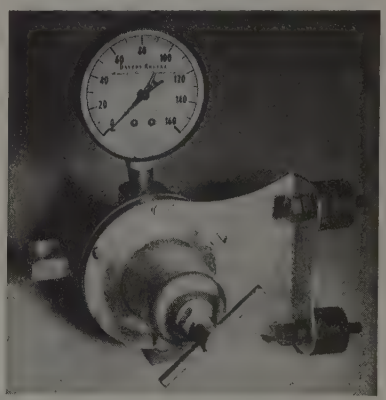
17. Power Stirrer

Through a 15 to 1 gear reduction the Power-Stir, manufactured by Eberbach & Son Co., Ann Arbor, Mich., has a continuous duty resistance controlled motor with a speed range of 450 to 1200 rpm without load. Mounting rod ½ x 9 in. facilitates adjustment on any support. Knob controls built-in rheostat and built-in fan and duct system cools the unit. Twelve 18 and 24 in. shaft lengths are offered for the stirring rods which are of propeller type, made of stainless steel with ¼-in. shafts and 2½-in. diameter propellers. Operation is on 115 v ac or dc current.

18. Valve and Gage

A combination reducing regulating valve and pressure gage, made in ¼, ⅜, ½ and ¾-in. pipe size connections is announced by Dayton Rogers Mfg. Co., Minneapolis, Minn. Valve reduces line or primary pressures to a desired lower working pressure and automatically maintains that pressure. Gage records the amount of air pressure used on the tools or apparatus, pressure of which is controlled by the valve.

Each unit is provided with two rubber shock absorbing vibration damp-



eners so that when it is mounted on a piece of equipment, all shock is eliminated, thus protecting the unit. Combination valve and gage may be used on all shop air lines for regulating the air pressures from 5 to 150 psi.

19. Signaling Timer

Designed to command visual and audible attention the instant a time interval is completed, the series S signalling timer produced by Industrial Timer Corp., 110 Edison place, Newark 5, N. J., automatically closes or opens a circuit at the end of elapsed time. It also operates additional buzzers, bells or lights at remote locations.

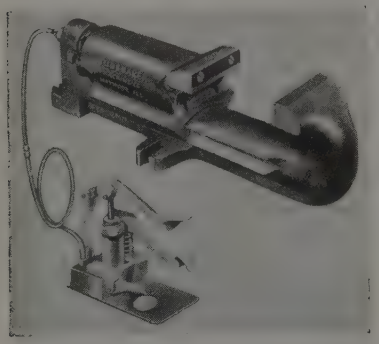
When pointer is manually set to required interval shown on the dial, a circuit is closed which operates a pilot light indicating that the time interval has started. The time elapsed is shown on the dial. Audible alarm sounds and light goes out when interval is completed. Signal continues until toggle switch on timer is snapped off or interval is restarted.

Timer operates on 115 or 230 v ac, 25, 50 or 60 cycles. Motor is slow speed,

self-starting synchronous type. Dial calibrations range from 1 sec to 5 min and maximum intervals from 1 min to 3 hours.

20. Hydraulic Vises

Foot-operated hydraulic Speedvises, made by Studebaker Machine Co., 1221 South 9th avenue, Maywood, Ill., are built to eliminate hinging action under pressure. Adjustment for wear is effect-



ed by built-in gibs of high grade steel set at a 45 degree angle in V-ways of semisteel. Vise jaws are machined to 0.001-in. tolerance.

Vises are entirely self contained. With their foot-operated hydraulic pump units, pressures from a feather touch to a 7½-ton squeeze can be built up. Jaw action can be controlled from very fast to very slow. Mounting is in either a horizontal or vertical position for a wide variety of operations. Model No. 750 has 7½-in. maximum jaw opening, 4½-in. jaw depth, 5¼-in. jaw width and 7½-ton maximum pressure. No. 500 has a 5-in. jaw opening, 3-in. depth, 4¼-in. width and 5 tons maximum pressure.

21. Soldering Compound

Galvalloy made by Metalloy Products Co., 1351 East 17th street, Los Angeles, makes possible tinning on magnesium and use of pure zinc as a filler or soldering agent. Molten zinc can be poured against its surface and a permanent bond obtained. Ordinary zinc or pot metal may be used instead of zinc. This compound may also be used in the repair of corroded areas in degreasing tanks, withstanding corrosive action of the vapors satisfactorily.

22. Woven Wire Conveyor

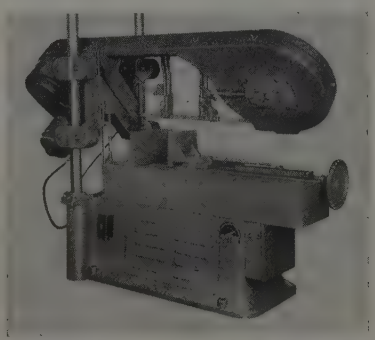
Turning of corners is the outstanding feature of Flex-Grid woven wire conveyor, made by Cyclone Fence Division of American Steel & Wire Co., North Chicago, Ill. The belt is made from parallel wires linked together at both ends, forming a steel belt or chain. It can be furnished in carbon steel, uncoated, galvanized or tinned, or in stainless steel.

Operating in single pitch, it operates as a straight line conveyor. In multipitch (depending upon its width) it will turn corners with an inside radius of from 14 to 45 in.

23. Metal Saw

An automatic cutting cycle in which the blade is fed into the work at a constant pressure and cutting head is returned by hydraulic power to its starting position above the work upon completion of the cut, is a feature of the No. 12 heavy duty horizontal metal cutting band saw introduced by Wells Mfg. Corp., Three Rivers, Mich. It is designed for cutting off rectangular stock up to 12 in. deep and 16 in. wide or cylindrical stock up to 12¾-in. diameter.

In addition to cutting through stock,



it may be automatically controlled to cut to any desired depth for work on dies or other parts. Of heavy and rigid construction, its bed and base are castings. Cutting head rides on closely fitted rollers on two heavy columns. Hydraulic system is enclosed in the base. Blade is enclosed except for cutting zone.

Cutting speeds are 50, 90 or 150 fpm. A 3/4-hp motor drives the blade and a 1/3-hp motor the hydraulic pump. Rate of feed is controlled in order to maintain a constant limited pressure between blade and stock.

24. Rust Preventives

Four new rust preventives for various applications are announced by U. B. Bray Co., 3344 East Medford street, Los Angeles 33. Applicable by spray or brush, Brayco 100 is a hard drying preventive designed to meet extreme conditions of humidity, heat, weathering and cold when applied to metal and other surfaces for outdoor storage. Brayco 120 is both a rust preventive and lubricating or slushing oil of low viscosity, for use in protecting internal combustion engines and metal surfaces for a period of 6 months to a year. Resisting heat, Brayco 124 will gradually harden with age, but always remains soft enough to be removed by wiping. In grease form, it may be applied by brush or swab at room temperature or by hot dipping when heated to 150° F. Ability to displace traces of moisture from metal surfaces is feature of Brayco 150, intended to be used after removal of metal from any type of bath.

25. Curved Tooth File

The Vixen Wizcut curved tooth file, manufactured by Heller Brothers Co., Newark, N. J., is fast cutting, smooth-finishing, self-clearing and nonclogging, this being made possible by serpentine-like chip breaking grooves superimposed on the curved contour of the milled teeth. File cuts with a shearing action, regardless of whether it is pushed straight ahead or at an angle.

26. Lighting Fixture

Midwest Lighting Fixture Co., 1357 Beach parkway, Cleveland 7, announces a lighting fixture for plant interiors where an atmosphere of dirt, chemicals and other foreign matter cannot be avoided. The hermetically sealed silvering in the double walled glass reflector cannot peel, is unaffected by different atmospheres;

reflector may be easily cleaned without removing from fixture.

Fixture is adaptable for high or low bay lighting. Housing is aluminum and all parts are cadmium plated. It is manufactured in two sizes, one for 200, 300 or 400 w lamps and the other for 750 w incandescent or 400 w mercury lamps.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Steel Demand Seen Holding Despite Increase in Prices

Pressure for shipments to continue unrelieved though more cautious buying policies are thought likely. Steel prices up 10 per cent on average. Durable goods manufacturers to pass increase on to their customers

HIGHER steel prices are not likely to materially put a damper on consuming demand soon although buyers, as a general thing, are expected to adopt somewhat more conservative purchasing policies than have prevailed over recent months.

Indications are the mills will continue under abnormal pressure for shipments for months to come with metalworking shops unable to obtain all of the tonnage they would be willing to purchase. This is especially so with respect to sheets and strip, tubular goods and bars.

Full impact of the higher steel prices on consuming industry will be impossible to assess for a few weeks. For that matter, the actual extent of the steel increase was not possible of determination even late last week for the simple reason action had not been taken on some products by all producers. On the whole, however, it appeared the overall increase in published prices will work out somewhere around 10 per cent. Increases vary as to product, ranging from $5 to $10 per ton on the various items.

With steel consumers facing an estimated increase of $32 million monthly in their steel bills in the closing five months of this year, expectations are manufacturers of durable and capital goods will promptly pass along the higher steel cost to their customers. Based on product shipments in the first half of this year, it is estimated the metalworking shops will pay at least $160 million more for their steel than they did in the first seven months of the year, and on an annual basis the increase figures out to a boost in consumers' steel costs of around $385 million.

Extent to which manufacturers of goods made of steel will raise their prices is uncertain. Steel costs vary with the individual product, depending upon the amount of metal consumed in manufacture. For example, steel for the average automobile will cost about $14 per unit more, while the increased cost of steel for a household refrigerator will amount to only about 65 to 70 cents. However, such figures do not provide a sound basis for figuring increased fabricating costs since numerous other factors exert a bearing. For the most part, it is believed markups on manufactured goods will probably approximate the average 10 per cent increase effected on steel products.

How long the current level of steel prices will hold is debatable. In announcing new price lists several producers indicated the higher quotations did not entirely cover increased costs and with raw materials continuing to rise, there is likelihood of further revisions in steel lists before the end of the year.

Scrap presents a particularly serious threat. Prices are zooming to unprecedented levels with sales of steelmaking grades reported above $42 per ton and brokers bidding up to $45. At one or two points the upswing appeared to be losing momentum last week, but the situation is replete with explosive possibilities since the higher prices being offered do not appear to be attracting much additional tonnage to market. At the same time, with scrap quoted substantially above pig iron, reversal of the normal relationship, pressure for iron continues greater than ever. Should scrap continue to rise a further advance in pig iron prices would not be surprising.

Steel ingot production held at a high level last week, the estimated national rate holding at 95 per cent of capacity. Although the rate was unchanged, the trend was upward with gains being recorded of 7 points to 94 per cent in Cincinnati, 2½ points to 89 per cent in Wheeling, 1 point to 93 per cent in Cleveland, and ½ point to 100 per cent in Pittsburgh.

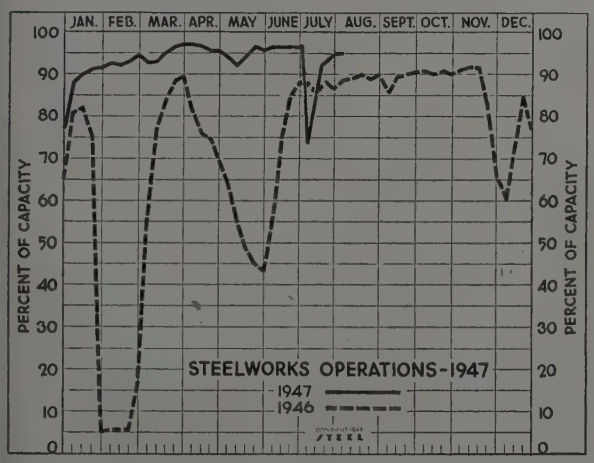
STEEL's composite market averages last week advanced as follows: To $74.77 from $69.14 on finished steel; to $56.70 from $52.10 on semifinished steel; and to $40.42 from $39.08 on steelmaking scrap. The steelmaking pig iron average held unchanged at $35.61.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Aug. 2	Change	Same Week 1946	Same Week 1945
Pittsburgh	100	+ 0.5	95	87.5
Chicago	94	None	89.5	94.5
Eastern Pa.	94	None	84	87
Youngstown	90	None	88	90
Wheeling	89	+ 2.5	93.5	91.5
Cleveland	93	+ 1	90	75.5
Buffalo	88.5	None	88.5	83.5
Birmingham	99	None	99	95
New England	90	None	75	86
Cincinnati	94	+ 7	85	94
St. Louis	84.5	None	54.5	68
Detroit	92	None	86	83
Estimated national rate	95	None	88.5	89.5

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.



COMPOSITE MARKET AVERAGES

	Aug. 2	July 26	July 19	One Month Ago July, 1947	Three Months Ago May, 1947	One Year Ago Aug., 1946	Five Years Ago Aug., 1942
Finished Steel	*$74.77	$69.14	$69.82	$70.67	$69.82	$64.45	$56.73
Semifinished Steel	*56.70	52.10	52.10	53.02	52.10	40.60	36.00
Steelmaking Pig Iron	35.61	35.61	32.92	33.82	32.49	27.50	23.00
Steelmaking Scrap	40.42	39.08	36.08	37.23	29.75	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

* Preliminary.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	Aug. 2, 1947	July, 1947	May, 1947	Aug., 1946
Steel bars, Pittsburgh	2.90c	2.66c	2.60c	2.50c
Steel bars, Philadelphia	3.28	3.04	2.98	2.86
Steel bars, Chicago	2.90	2.66	2.60	2.50
Shapes, Pittsburgh	2.80	2.56	2.50	2.35
Shapes, Philadelphia	2.94	2.70	2.64	2.48
Shapes, Chicago	2.80	2.56	2.50	2.35
Plates, Pittsburgh	2.95	2.71	2.65	2.50
Plates, Philadelphia	3.15	2.91	2.85	2.558
Plates, Chicago	2.95	2.71	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.56	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.55	3.27	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.95	3.63	3.55	†4.05
Sheets, hot-rolled, Gary	2.80	2.56	2.50	2.425
Sheets, cold-rolled, Gary	3.55	3.27	3.20	3.275
Sheets, No. 10 galv., Gary	3.95	3.63	3.55	†4.05
Strip, hot-rolled, Pittsburgh	2.80	2.56	2.50	2.45
Strip, cold-rolled, Pittsburgh	3.55	3.27	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.675	3.475	3.425	3.05
Wire nails, Pittsburgh	4.25	3.975	4.125	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$60.00	$52.00	$50.00	$38.00
Slabs, Pittsburgh, Chicago	50.00	43.60	42.00	39.00
Rerolling billets, Pittsburgh	50.00	43.60	42.00	39.00
Wire rods 7/32 to ¼-inch, Pitts.	2.80c	2.60c	2.55c	‡2.30c

‡ Base, No. 5 to 5/32-in.

Pig Iron

	Aug. 2, 1947	July, 1947	May, 1947	Aug., 1946
Bessemer, del. Pittsburgh	$37.83	$36.03	$34.83	$29.77
Basic, Valley	36.00	34.20	33.00	28.00
Basic, eastern del. Philadelphia	39.54	36.72	35.52	29.93
No. 2 fdry., del. Pgh. N. & S. sides	37.33	35.53	34.33	29.27
No. 2 fdry., del. Philadelphia	39.22	37.22	36.02	30.43
No. 2 foundry, Chicago	36.00	34.20	33.00	28.50
Southern No. 2 Birmingham	33.38	31.98	29.88	24.88
Southern No. 2, del. Cincinnati	38.25	36.85	34.75	28.94
Malleable, Valley	36.50	34.70	33.50	28.50
Malleable, Chicago	36.50	34.70	33.50	28.50
Charcoal, low phos., fob Lyles, Tenn.	44.00	43.00	40.50	33.00
Gray forge, del. McKees Rocks, Pa.	36.66	34.86	33.66	28.61
Ferromanganese, fob cars, Pittsburgh	140.25	140.25	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$41.50	$37.20	$30.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	40.50	38.55	28.35	18.75
Heavy melt. steel, Chicago	39.25	35.95	29.25	18.75
Rails for rerolling, Chicago	46.75	43.20	34.50	22.25
No. 1 cast, Chicago	43.50	41.10	36.90	20.00

Coke

Connellsville, beehive furnace	$12.00	11.20	9.125	8.75
Connellsville, beehive foundry	14.50	13.05	10.375	9.50
Chicago, oven foundry, del.	18.50	17.46	16.10	15.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality, $40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Price negotiated, fob mill, Pittsburgh, Canton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $50, sales by smaller interests on negotiated basis at $65 or higher. Detroit, del., $53; eastern Mich., $54.

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $58; Detroit, del., $61; eastern Mich., $62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $60; sales by smaller interests on negotiated basis at $66 or higher.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.65c per lb.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to ¼-in., inclusive $2.85-3.05 per 100 lb. Galveston base, $2.95. Worcester, 2.90c. San Francisco (base del.), $3.27.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.31c; Phila., del., 3.28c; San Francisco (base, del.), 3.33-3.65c; Los Angeles (base, del.), 3.325-3.56c; Seattle, 3.285c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base price upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.00c; New York, del., 3.09c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngs own, Middletown, base, 3.55c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 3.96c; Philadelphia, del., 3.93c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base 3.95c; New York, del., 4.24c; Philadelphia, del., 4.15c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc), corrugated 10 cents extra; Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.) 4.945c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.95c; Granite City, base, 3.65c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c. Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.10c.

Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 5.85c.

Dynamo: Pittsburgh, 6.45c; Granite City, 6.55c. Transformer 72, 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c.

Cold-Rolled Strip, 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.00, 7.15c; over 1.00, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $13.50; 15-16 $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, Geneva, Utah, 3.15c; New York, del. 3.24c; Phila., del., 3.15c; St. Louis, del., 2.77c; Boston, del., 3.16c; San Francisco and Los Angeles, del., 3.29c-3.46c.
(Central Iron & Steel Co., Harrisburg, Pa., 4.15c, basing points.)

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.00c; Phila., del., 2.94c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.); 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c.
(Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer $3.55-3.80
Spring (except Birmingham) .... **$4.25-**$4.50

Wire Products to Trade

Nails

Standard and cement-coated ..... †$4.25
Galvanized ..... ‡$4.00
Staples, polished and galvanized $4.25

Wire, Merchant Quality

Annealed (6 to 8 base) ..... §$4.20
Galvanized (6 to 8 base) ..... §§$4.65
(Fob Pittsburgh, Chicago, Birmingham, per base column)

Woven fence, 15 gage and heavier ... ††91
Barbed wire, 80-rod spool ..... ††101
Barbless wire, twisted 94
Fence posts (no clamps) ..... ††90
Bale ties, single loop ..... ††91

* Worcester, $3.65, Duluth, $3.60, base. San Francisco (base, del.) $4.31 for bright basic only.

** Worcester $4.60, Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.55, Cleveland $4.35, base. San Francisco (base, del.) $4.83.

‡ Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del.) $4.83.

§ Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $4.96, annealed; $5.41, galvanized.

†† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.
Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base. Seattle. Splice bars, $3.25 per 100 lb. Standard spikes, 4.00c-4.50c; screw spikes, 5.80c-6.40c.

Tubular Goods

(Following prices and discounts nominal pending issuance of new schedules by producers.)

Standard Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	48	23	¼	— 2	+20
¼ & ⅜	51	30½	⅜	—11½	+10
½	55½	41	1-1¼	—17	+ 2
¾	58½	45	1½	—22½	— 1½
1-3	60½	47½	2	—23	— 2

Lap Weld

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
2	53	39½	1¼	— 1	+20
2½-3	56	42½	1½	— 7	+13
3½-6	58	44½	2	—14½	+ 5½
*8	58	42½	2½-3½	—17	+ 1½
*10	57½	42	4	—21	— 4
*12	56½	41	4½-8	—19	—2½
			9-12	—10	+ 7

* Not T. & C.

Seamless Steel

In.	Blk.	Gal.	In.	Blk.	Gal.
2	52	38½	*8	57	42
2½-3	55	41½	*10	56½	42
3½-6	57	43½	*12	55½	41

* Not T. & C.

Line Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Seamless	In.	Butt Weld
2	51	⅛	47
2½ & 3	54	¼ & ⅜	50
3½ to 8	56	½	54½
10	55½	¾	57½
12	54½	1 to 3	59½

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

		—Seamless—		—Elec. Weld—	
O.D.		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1"	13	....	$10.89	$10.62	$10.62
1¼"	13	....	12.90	10.59	12.58
1½"	13	$12.00	14.26	11.70	13.90
1¾"	13	13.65	16.23	13.31	15.82
2"	13	15.29	18.17	15.00	17.95
2¼"	13	17.05	20.26	16.71	20.00
2¼"	12	18.78	22.31	18.38	22.00
2½"	12	20 57	24.43	20.11	24.07
2¾"	12	21.80	25.89	21.27	25.46
3"	12	22.87	27.18	22.26	26.68
3¼"	11	26.88	31.94	26.15	31.33
3½"	11	28.86	34.30	28.06	33.64
4"	10	35.82	42.55	34.78	41.68
4½"	9	47.48	56.42	....	....
5"	9	54.96	65.30	....	....
6"	7	84.38	100.25	....	....

Pipe, Cast Iron: Class B, 6-in. and over $65 per net ton, Birmingham; $70, Burlington, N. J.; $75.56, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	48 off
⅝ and ⅝ x 6-in. and shorter	50 off
Larger diameter; longer than 6 in.	47 off
Tire bolts	38 off
Step bolts	46 off
Plow bolts	57 off
Lag bolts	
¼ in. up to 1 in., 6 in. and shorter	50 off
¼ in. up to 1 in., longer than 6 in.	48 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller	51 off	....
½-in. and smaller	....	50 off
½-in.-1-in.	48 off	....
⅝-in.-1-in.	....	49 off
1⅛-in.-1½-in.	46 off	47 off
1⅝-in. and larger	....	40 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

Upset 1-in. smaller (10-20 bright)	56 off
Upset (10-35 heat treated)	
⅝ x 6	51 off
¾, ⅞, & 1 x 6	47 off

Square Head Set Screws

Upset 1-in. and smaller	61 off
Headless, ¼-in. and larger	46 off
No. 10 and smaller	56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural	5.25c
Lebanon, Pa.	5.40c
7/16-in. and under	55-5 off
Lebanon, Pa.	55-5 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1.50-$2.00 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26 00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27 50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50	51.00	40.50	51.00
310	53.50	56.50	57.50	53.00	61.00
316	43.50	48 00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36 00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403	23.50	27.00	32.00	23.00	29.50
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442	24.50	28.00	35.50	26.00	35.00
443	24.50	28.00	35.50	26.00	35.00
446	30 00	33.00	39.50	38.00	56.50
*501	9 00	13.00	17.50	13.00	18.50
*502	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices, per gross ton, do not include 3 per cent federal tax

PIG IRON

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$37.50	$37.00	$38.50	$38.00
Newark, N. J., del.	39.34	38.84	40.34	39.84
Brooklyn, N. Y., del.	40.50	....	....	41.00
Philadelphia, del.	39.22	38.72	40.22	39.72
Birdsboro, Pa., base	40.50	40.00	41.50	41.00
Birmingham, base	33.38	32.88	....	....
Baltimore, del.	39.78	....	....	....
Chicago, del.	37.12	....	....	....
Cincinnati, del.	38.25	....	37.75	....
Newark, N. J., del.	39.46	....	....	....
Philadelphia, del.	38.84	....	....	....
St. Louis, del.	37.37	....	36.87	....
Buffalo, base	36.00	35.50	37.00	36.50
Boston, del.	42.48	41.98	43.48	42.98
Rochester, del.	37.84	37.34	38.84	38.34
Syracuse, del.	38.50	38.00	39.50	39.00
Canton, Massillon, O., base	36.00	35.50	....	36.50
Chicago, base	36.00	35.50	37.00	36.50
Milwaukee, del.	37.32	36.82	38.32	37.83
Muskegon, Mich., del.	39.83	....	....	40.33
Cleveland, fob furnace	36.00	35.50	37.00	36.50
Akron, del.	37.67	37.17	38.67	38.17
Duluth, base	36.50	36.00	37.50	37.00
Erie, Pa., base	36.00	35.50	37.00	36.50
Everett, Mass., base	45.00	....	....	45.50
Granite City, Ill., base	37.00	36.50	....	37.00
St. Louis, del.	37.75	37.25	....	37.75
†**Neville Island, Pa.,** base	36.50	36.00	37.00	36.50
Pittsburgh, del., N. & S. Sides	37.33	36.83	37.83	37.33
Provo, Utah, base	36.50	36.00	....	....
Seattle, Tacoma, Wash., del.	41.60	....	....	....
Portland, Oreg., del.	41.60	....	....	....
Sharpsville, Pa., base	36.50	36.00	37.00	36.50
Steelton, Pa., base	37.50	37.00	38.50	38.00
Struthers, O., base	37.00	36.50	37.50	37.00
Swedeland, Pa., base	39.00	38.50	40.00	39.50
Troy, N. Y., base	38.00	37.50	39.00	38.50
Toledo, O., base	36.00	35.50	37.00	36.50
Cincinnati, del.	39.50	39.00	....	....
Youngstown, O., base	36.50	36.00	37.00	36.50
Mansfield, O., del.	39.48	38.98	39.98	39.48

† To Neville Island base add: 66c for McKees Rocks, Pa., $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33, Oakmont, Verona; $1.49 Brackenridge.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base) $45.50
6.51-7.00..$46.75 9.01- 9.50. 53.00
7.01-7.50.. 48.00 9.51-10.00. 54.25
7.51-8.00.. 49.25 10.01-10.50. 55.50
8.01-8.50.. 50.50 10.51-11.00. 56.75
8.51-9.00.. 51.75 11.01-11.50. 58.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron: Si 14.01-14.50%, $66.75, Jackson, O.; $70, Niagara Falls; $74, piglets, $72, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$44.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00; Birdsboro, Pa., $45 base; Philadelphia, $44.22, del. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	$11.50-$12.50
Connellsville, foundry	14.00- 15.00
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$15.35
Chicago, outside del.	17.50
Chicago, del	18.50
Terre Haute, del.	18.05
Milwaukee, ovens	18.25
New England, del.	17.25
Birmingham, del.	15.00
Indianapolis, ovens	17.00
Cincinnati, del.	16.50
Ironton, O., ovens	15.50
Painesville, ovens	16.60
Cleveland, del.	17.90
Buffalo, del.	18.25
Detroit, del.	17.65
Philadelphia, ovens	15.50
Swedeland, Pa., ovens	15.50
Portsmouth, O., ovens	16.00
Fairmont, W. Va., ovens	15.75
Pittsburgh, del.	17.61

Coal Chemicals

Spot, gal. freight allowed east of Omaha. Effective as of Apr. 1, 1947.

Pure and 90% benzol	19.00c
Toluol, two degrees	23.00c
Industrial xylol	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "house-hold use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

Refractories

Per 1000, fob shipping point Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50–6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$32–$34

Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$27-$27.50
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	3.85	3.85	3.85	3.85	3.85	3.85	...	...	...
Cold-Rolled	4.75	4.75	4.75	4.75	...	4.75	...	...	...
Galvanized	5.40	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	3.85	3.85	3.85	3.85	...	...	...	...	...
Cold-Rolled	4.55	4.65	4.65	4.65	...	...	...	...	...
Shapes Structural	3.85	3.85	...	3.85	...	...	3.85	...	...
Plates	4.10	4.10	4.10	...	4.10	...	..	...	...
Bars and Bar Shapes	4.00	4.00	4.00	4.00	...	4.00	..	4.00	4.00

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras. Published quotations are nominal and subject to change pending clarification of price situation.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. •10G	Gal. •24G	†H-R	†C-R	½-R Rds. ⅜" to 3"	C-F Rds. ½"& up	H-R Alloy (§4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (City)	4.50	5.67[4]	5.22[4]	5.55[4]	6.80[4]	4.65	6.36	4.62	5.22	7.12	4.47	4.70	6.42
††New York (city)	4.42	5.72	5.42[3]	5.47[3]	....	4.67	....	4.67	5.17	8.42[13]	4.42	4.82	6.40
New York (country)	4.32	5.57	5.27[3]	5.37[3]	....	4.52	....	4.52	....	....	4.27	4.67	6.25
Philadelphia (city)	4.34	5.73[9]	5.33[9]	5.29[5]	6.54[5]	4.43	5.28	4.48	5.13	6.87	4.22	4.44	5.93
Philadelphia (country)	4.24	5.63[9]	5.23[9]	5.19[5]	6.44[5]	4.33	5.18	4.38	....	6.60	4.12	4.34	5.83
Baltimore (city)	3.99†	5.50[3]†	5.20[3]†	5.14[5]	6.39[5]	4.40	....	4.45	5.10	....	4.34	4.39	5.90
Baltimore (country)	3.89†	5.40[3]†	5.10[3]†	....	....	....	....	....	....	....	4.24	4.29	5.80
Washington (city)	4.35	....	....	5.18[5]	6.43[5]	4.65	....	4.70	5.60[11]	....	4.60	4.65	6.60
Norfolk, Va.	4.35	....	....	....	....	....	....	4.75	5.50	....	4.50	4.50	6.25
Memphis, Tenn. (city)	4.47[20]	....	5.53[20]†	5.97[5]	....	4.72[20]	....	4.67[20]	5.78	....	4.67[20]	4.92[20]	6.58[20]
Memphis, Tenn. (country)	4.37[20]	....	5.43[20]†	5.87[5]	....	4.62[20]	....	4.57[20]	5.68	....	4.57[20]	4.82[20]	6.48[20]
Buffalo (city)	4.15	....	4.85[3]	5.35[5]	....	4.30	5.25	4.10	4.75	....	4.10	4.55	5.90
Buffalo (country)	4.00	....	4.70[3]	4.95[5]	....	3.90	4.85	3.95	4.60	6.60	3.95	4.10	5.45
Pittsburgh (city)	3.95†	....	4.75[3]†	5.10[5]	6.35[5]	4.05	5.00	4.10	4.75	6.60	4.10	4.30	5.60
Pittsburgh (country)	3.80†	....	4.60[3]†	4.95[5]	6.20[5]	3.90	4.85	3.95	4.60	6.60	3.95	4.15	5.45
Youngstown, O. (city)	4.188	5.338	4.888	5.05	6.30	4.00	....	4.238	5.138	....	4.218	4.488	5.178
Youngstown, O. (country)	....	....	....	4.95	6.20	3.90	....	....	....	....	....	....	....
Detroit	4.05	5.30	4.85†	5.42	6.67	4.34	5.24	4.20	4.87[12]	7.01	4.42	4.49	5.92
Cleveland (city)	4.15	5.15[3]	4.85[3]	5.238[5]	6.488[5]	4.188	5.10	4.10	4.75	6.858	4.311	4.25	5.961
Cleveland (country)	4.00	5.00[3]	4.70[3]	....	....	3.90	4.95	3.95	4.60	....	....	4.10	....
Cincinnati	4.016	4.816[3]	....	5.166[5]	6.416[5]	4.394	....	4.403	5.053	....	4.444	4.558	5.944
Chicago (city)	4.15	5.15[3]	4.85[3]	5.10[5]	6.35[5]	4.05	5.10	4.10	4.75	6.60[17]	4.10	4.30	5.75
Chicago (country)	4.00	5.00[3]	4.70[3]	4.95[5]	6.20[5]	3 90	4.95	3.95	4.60	6.60[12]	3.95	4.15	5.60
Milwaukee	4.299	5.299[3]	4.999[3]	5.249[5]	6.499[5]	4.199	5.249	4.249	4.899	6.899	4.249	4.449	5.899
St. Paul, Minneapolis	4.284[13]	....	5.084[3]†	5.434[5]	6.684[5]	4.384[13]	....	4.434[13]	5.476[11]	7.084[11]	4.434[13]	4.584[13]	6.084[13]
Indianapolis	4.04	....	4.84[3]	5.29[5]	6.54[5]	4.24	....	4.36††	5.26	....	4.36	4.61	6.01
St. Louis	4.699	....	4.899[3]†	5.424[5]	6.674[5]	4.199	....	4.249	5.074[12]	7.074	4.249	3.999	5.899
Birmingham (city)	4.15[20]	....	....	5.25[5]	....	4.15[20]	....	4.15[20]	5.58	....	4.10	4.35	6.56
Birmingham (country)	4.00[20]	....	....	5.10[5]	....	4.00[20]	....	3.95[20]	....	....	3.95	4.20	....
New Orleans	4.68[20]•••	....	5.94[3]	....	....	4.88[20]	....	4.83[20]•••	5.94[11]	....	4.73[20]•••	5.03[20]	6.99[20]
Houston, Tex.	6.00[1]	....	....	6.00	....	6.00[1]	....	5.35[1]	....	6.35	5.85	5.85	6.40
Omaha, Nebr.	4.968	....	....	5.918[5]	7.168[5]	4.868	....	4.918	5.568[11]	....	4.918	5.068	6.568
Los Angeles	5.35	....	7.00[3]	....	7.45[5]	5.65	8.35	5.10	6.90[18]	9.35	5.20	5.10	7.20
San Francisco	4.90[21]	....	6.30[3]	....	7.35[5]	5.20[14]	8.35[14]	4.75[14]	•••	9.35[14]	4.90[14]	5.00[14]	6.80[14]
Seattle and Tacoma, Wash.	5.00[17]	....	6.75[3]	6.30[5]	....	5.30[17]	....	5.00[17]	7.10[18]	8.50[13]	4.95[17]	5.15[17]	7.35[17]

Base Quantities: 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; [1]—any quantity; [2]—300 to 1999 pounds; [3]—150 to 2249 pounds; [4]—three to 24 bundles; [5]—450 to 1499 pounds; [6]—one bundle to 1499 pounds; [7]—one to nine bundles; [8]—400 to 1499 pounds; [9]—1000 to 1999 pounds; [10]—450 to 39,999 pounds; [11]—1000 to 39,999 pounds; [12]—1000 pounds and over; [13]—400 to 14,999 pounds; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999; [17]—300 to 9999 pounds; [18]—1500 to 1999 pounds; [19]—1500 to 39,999; [20]—400 to 9999 pounds; [21]—400 lb and over.

• Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; •• add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier; ••• rounds under ⅝ in. 7.00c, ⅝ in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegeleisen: 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., $44, Pittsburgh, $48. 16% to 19% Mn, Pittsburgh, $47.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140.25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie - Illinois Steel Corp. is producer); add $8 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn). Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, $2.27; contract, $2.25; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; smaller lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots $1.35; smaller lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High - Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6-8% C, $142.50; 3-5% C, $157.50.

Ferrovanadium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots $1.20, smaller lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.50; smaller lots $2.55. Spot up 10c.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. **High carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. **Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l.; and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carlot packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots. **S. M. Ferrochrome, high carbon:** (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Prices are per pound of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched 0.25c higher.

Chromium Metal: 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb c.l. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract, ton lot or more, $1.60; 100 to 1999 lb, $1.95; less than 100 lb, $3.15 per lb of metal, eastern zone; $1.615, $1.965 and $3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l., 14.10c; 2000 lb to c.l. 15.60c; central, 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about ½ lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2½ lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn., max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots $1.89, less $2.01, eastern, freight allowed; $1.903 and $2.023, central; $1.935 and $2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance). Prices per lb of alloy: Contract, 5 tons or more $1.90, 1 ton to 5 tons $2.00, smaller lots $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Price per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

GMSZ Alloys 4 & 5: (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern. freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

Zirconium alloy: Z 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed

Tungsten Metal Powder: Spot, not less than 98.8%, $2.90, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% Na_2O; or air dried, 83-85% V_2O_5 and 5.15% Na_2O, $1.10 per lb contained V_2O_5 fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Major Nonferrous Metal Prices Hold Steady

Advances of ¾ to 1-cent in brass ingots feature an otherwise steady and quiet market

NEW YORK—Only $35 million was appropriated by Congress for the year ending June 30, 1948, for payments under the Premium Price Plan Act of 1947 for copper, lead, zinc, and manganese. While this sum is believed to be inadequate and compares with payments of $75 million in 1946 and $60 million for 1947 to date, proponents of the program expect additional authorizations if they are necessary next year.

Nonferrous metal markets were steady last week, contrasting sharply with the ferrous markets, while buying interest was quiet.

COPPER—Producers and custom smelters continued to book moderate tonnages of copper on the basis of 21.50c, Connecticut Valley, for electrolytic. Market interests are watching labor developments at the copper producing properties closely, since any prolonged interruption to operations would immediately tighten available supplies. As of the close of June, there was an apparent deficit of 220,424 tons between supplies and requirements compared with a deficit of 251,175 tons at the end of the previous month. Shipments to fabricators recently, however, have been in excess of consumption.

BRASS AND BRONZE INGOTS—Prices of most grades of brass and bronze ingots advanced ¾-cent to 1-cent a pound, effective as of July 28. Prices for the 85-5-5-5 ingot group advanced 1 cent. All of the yellow ingots advanced ¾-cent while those in the 80-10-10 and 88-10-2 groups advanced from ½ cent to 1 cent in nearly all cases. One or two items in these groups were adjusted upward by from 1¾ cents up to 2½ cents. The rise in prices was attributed to the firmer tone in the red metal scrap market. One leading producer pointed out that where good quantities of certain kinds of scrap are required, one must pay about 1 cent per pound above recently prevailing prices. It was also stated that whereas new business in brass ingots had been at a low ebb for some time, an improved demand was developed recently.

Shipments of brass and bronze ingots by manufacturers accounting for about 95 per cent of total deliveries amounted to 15,929 tons in June, a decline of about 4000 tons from the May total. Total for the first six months was 140,035 tons, or a drop of 32,600 tons from the 172,365 tons shipped during the like period a year ago. July shipments are expected to show a moderate increase.

LEAD—No new developments were noted in the domestic market last week, producers disposing of daily quotas easily on the basis of 14.80c to 14.85c, St. Louis.

Shipments of lead die castings declined 30 per cent to a total of 1 million pounds from 1,400,000 pounds in April. The greater part of the loss affected commercial castings. At the end of May, unfilled orders for commercial castings approximated two months' shipments at the current rate of activity.

ZINC—Following passage of the Premium Price Plan Act of 1947, mining men in the Tri-State district prepared to resume operations immediately. About two-thirds of the mines and mills throughout the district had been shut down since July 4, pending action on the program, resulting in a drop in production to less than one-third normal capacity.

Demand in the domestic market was orderly on the basis of 10.50c, East St. Louis, for prime western.

TIN—Some leading interests in the tin market here do not agree with the opinion expressed recently by A. G. Glenister, chairman, Malayan Chamber of Mines that the world's production of tin will be insufficient to meet needs for some years to come. It was pointed out here that tin producers are anxious to benefit from the present sellers' market and will do everything in their power to expand production. Moreover, it was pointed out that producers know that 75 per cent of the 1941 production would provide all of the tin needed for actual requirements aside from stockpiling.

Consumers in both the United States and United Kingdom are getting about all the tin they actually need and there has been no curtailment of any essential operation due to lack of tin as there has been due to shortages of other raw materials.

Prices remained unchanged last week at 80.00c, New York, for Straits.

ALUMINUM — Permanente Metals Corp. has entered into the aluminum building materials and pig and ingot fields. During the first year of operation, the company produced about 87,000 tons of aluminum. The company has developed a new alloy especially designed for roofing and a siding for farm, residential and industrial application. Primary aluminum ingot prices are unchanged at 15.00c, fob shipping point

New Narrows Bridge To Take 10,000 Tons of Steel

Reconstruction of the Narrows bridge, which collapsed in a wind storm Nov. 8, 1940, will require about 10,000 tons of steel. The project has been delayed because of the scarcity of steel supplies. The Washington Toll Bridge Authority has authorized the sale of a $10 million bond issue to finance the project while it directed the state highway director to call for construction bids as soon as he deems it advisable, probably in the fourth quarter.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 19.00c; 88-10-2 (No. 215) 27.25c; 80-10-10 (No. 305) 23.00c; No. 1 yellow (No. 405) 15.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 13.75c; No. 12 foundry alloy (No. 2 grade) 13.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.50c; grade 3 (90-92%) 11.75c; grade 4 (85-90%) 11.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $84-$87 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb

Beryllium-Copper: 3.75-4.25% Be, $17 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg); $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 61.75c, per ounce.

Platinum: $53-$56 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.44c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

Copper Wire: Bare, soft, fob eastern mills, carlots 27.72c, less carlots 28.22c; weatherproof, fob eastern mills carlots 28.12c, less carlots 28.62c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq. ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electrodeposited, 29.09c; cast, 28.84c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb. 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb. 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.50, No. 2 copper 16.50, light copper 15.50, composition red brass 13.00, auto radiators 9.75, heavy yellow brass 9.00, brass pipe 9.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.00, No. 2 copper, 16.50-16.75, light copper, 15.50-15.75, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 13.62½.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire, No. 1 15.00-15.50, No. 2 13.75-14.00, light copper 12.50-13.00; No. 1 composition red brass 11.00-11.50, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings 12.00-12.50, No. 1 brass rod turnings 10.50-11.00, light brass 4.75-5.00, heavy yellow brass 6.50-7.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 8.50-8.75, cocks and faucets 8.50-9.00, brass pipe 8.25-8.50.

Lead: Heavy lead 10.50-11.00, battery plates 6.00-6.25, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 11.00-11.50, solder joints 15.50-16.00.

Zinc: Old zinc 5.00-5.50, new die cast scrap 3.75-4.00, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 7.50-8.00, old sheets 5.00-5.50, crankcase 4.00-4.50, borings and turnings 2.00, pistons, free of struts, 4.00-4.50.

Nickel: Anodes 18.50-19.00, turnings 15.50-16.50, rod ends 18.00-19.00.

Monel: Clippings 13.00-14.00, turnings 7.50-8.00, old sheet 11.00-12.00, rods 11.50-12.50, castings 9.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	41.00-42.00
No. 1 Busheling	41.00-42.00
Nos. 1, 2 & 3 Bundles.	41.00-42.00
Machine Shop Turnings	31.50-32.50
Mixed Borings, Turnings	31.50-32.50
Short Shovel Turnings.	33.50-34.50
Cast Iron Borings	33.50-34.50
Bar Crops and Plate	43.00-45.00
Low Phos. Cast Steel	43.00-45.00
Punchings & Plate Scrap	43.00-45.00
Cut Structurals	43.00-45.00
Elec. Furnace Bundles.	43.00-45.00
Heavy Turnings	32.00-33.00
No. 1 Chemical Borings	32.00-33.00

Cast Iron Grades

No. 1 Cupola	42.00-43.00
Charging Box Cast	41.00-42.00
Heavy Breakable Cast.	41.00-42.00
Stove Plate	39.00-40.00
Unstripped Motor Blocks	39.00-40.00
Malleable	48.00-49.00
Brake Shoes	37.00-38.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	43.50-44.50
Burnt Cast	38.00-39.00

Railroad Scrap*

No. 1 R.R. Heavy Melt.	42.00-43.00
R.R. Malleable	48.00-49.00
Axles	43.00-44.00
Rails, Rerolling	40.00-41.00
Rails, Random Lengths	41.00-42.00
Rails, 3 ft and under	43.00-44.00
Rails, 18 in. and under.	43.50-44.50
Railroad Specialties	47.00-48.00
Uncut Tires	42.00-42.50
Angles, Splice Bars	42.00-42.50

*Brokers buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$41.00-41.50
No. 2 Heavy Melt. Steel	41.00-41.50
No. 1 Busheling	41.00-41.50
Nos. 1 & 2 Bundles	41.00-41.50
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.00-32.50
Cast Iron Borings	32.00-32.50
Bar Crops and Plate	40.00-40.50
Cast Steel	45.00-46.00
Punchings & Plate Scrap	40.00-40.50
Elec. Furnace Bundles.	39.00-39.50
Heavy Turnings	37.00-37.50
Alloy Free Turnings	31.00-31.50
Cut Structurals	40.00-40.50

Cast Iron Grades

No. 1 Cupola	46.00-48.00
Charging Box Cast	42.00-44.00
Stove Plate	40.00-42.00
Heavy Breakable Cast.	43.00-44.00
Unstripped Motor Blocks	43.00-44.00
Malleable	56.00-57.00
Brake Shoes	42.00
Clean Auto Cast	47.00
No. 1 Wheels	45.00
Burnt Cast	40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-39.50
R.R. Malleable	56.00-57.00
Rails, Rerolling	44.00-45.00
Rails, Random Lengths	44.00-45.00
Rails, 3 ft and under	46.00-47.00
Railroad Specialties	46.00
Uncut Tires	44.00
Angles, Splice Bars	47.00

VALLEY

No. 1 Heavy Melt. Steel	$42.00-42.50
No. 2 Heavy Melt. Steel	42.00-42.50
No. 1 Bundles	42.00-42.50
Machine Shop Turnings	34.00-34.50
Short Shovel Turnings.	33.00-33.50
Cast Iron Borings	33.00-33.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00

MANSFIELD

No. 1 Heavy Melt. Steel	$43.00
Machine Shop Turnings	35.00
Short Shovel Turnings.	35.00

CINCINNATI

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
No. 1 Bundles	37.00
No. 2 Bundles	37.00
Machine Shop Turnings	31.00
Mixed Borings, Turnings	30.00
Short Shovel Turnings,	33.00
Cast Iron Borings	32.00

Cast Iron Grades

No. 1 Cupola Cast	47.00
Charging Box Cast	39.00
Heavy Breakable Cast.	40.00
Stove Plate	37.00
Unstripped Motor Blocks	40.00
Brake Shoes	36.00
Clean Auto Cast	46.00
Drop Broken Cast	50.00

Railroad Scrap

No. 1 R.R. Heavy Melt	41.00
R.R. Malleable	55.00
Rails, Rerolling	45.00
Rails, Random Lengths	45.00
Rails, 18 in. and under	50.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 1 Busheling	31.00-31.50
Nos. 1 & 2 Bundles	31.00-31.50
No. 3 Bundles	31.00-31.50
Machine Shop Turnings	26.50-27.00
Mixed Borings, Turnings	26.50-27.00
Short Shovel Turnings.	28.50-29.00
Cast Iron Borings	28.50-29.00
Punchings & Plate Scrap	38.00-38.50

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
Heavy Breakable Cast.	26.00-27.00
Clean Auto Cast	34.00-35.00

BUFFALO

No. 1 Heavy Melt. Steel	$42.00-44.00
No. 2 Heavy Melt. Steel	39.00-40.00
No. 1 Busheling	39.00-40.00
Nos. 1 & 2 Bundles	39.00-40.00
Machine Shop Turnings	30.00-31.00
Mixed Borings, Turnings	30.00-31.00
Cast Iron Borings	30.00-31.00
Short Shovel Turnings.	31.00-32.00
Low phos.	40.00-41.00
Elec. Furnace Bundles.	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Heavy Breakable Cast.	38.00-40.00
Malleable	50.00-52.00
No. 1 Wheels	38.00-40.00

Railroad Scrap

Rails, 2 ft and under	45.00-47.00
Railroad Specialties	45.00-46.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$40.00-41.00
No. 2 Heavy Melt. Steel	40.00-41.00
No. 1 Busheling	40.00-41.00
No. 1 Bundles	40.00-41.00
No. 2 Bundles	40.00-41.00
No. 3 Bundles	37.00-38.00
Machine Shop Turnings	31.00-32.00
Mixed Borings, Turnings	31.00-32.00
Short Shovel Turnings.	31.50-32.00
Bar Crops and Plate	44.00-44.50
Punchings & Plate Scrap	44.00-44.50
Cut Structurals	42.00-43.00
Elec. Furnace Bundles.	40.50-41.00
Heavy Turnings	40.00-41.00
No. 1 Chemical Borings	34.50-35.50

Cast Iron Grades

No. 1 Cupola Cast	47.00-48.00
Charging Box Cast	46.00-47.00
Heavy Breakable Cast.	45.50-46.50
Unstripped Motor Blocks	41.00-41.50
Malleable	55.00-57.00
Clean Auto Cast	47.00-48.00
No. 1 Wheels	47.50-48.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.25
No. 2 Heavy Melt. Steel	35.25
No. 1 Busheling	35.25
Nos. 1 & 2 Bundles	35.25
No. 3 Bundles	32.25
Machine Shop Turnings	25.00-25.50
Mixed Borings, Turnings	25.00-25.50
Short Shovel Turnings.	27.00-27.50
Punchings & Plate Scrap	37.00-37.50
Cut Structurals	37.00-37.50
Elec. Furnace Bundles.	36.25-36.50
No. 1 Chemical Borings	24.50-25.00

Cast Iron Grades

No. 1 Cupola Cast	41.50-42.00
Charging Box Cast	41.50-42.00
Heavy Breakable	41.50-42.00
Unstripped Motor Blocks	35.00-36.00
Malleable	51.00-53.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-36.00
No. 2 Heavy Melt. Steel	35.00-36.00
Nos. 1 & 2 Bundles	35.00-36.00
No. 1 Busheling	35.00-36.00
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	25.00-26.00
Short Shovel Turnings.	27.00-28.00
Bar Crops and Plate	37.00-38.00
Punchings & Plate Scrap	36.50-37.00
Chemical Borings	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	36.00-37.00
Unstripped Motor Blocks	32.00-34.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 & 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	35.50-36.50
Mixed Borings, Turnings	35.50-36.50
Short Shovel Turnings	34.00-34.50
Cast Iron Borings	35.00-35.50
Bar Crops and Plate	41.00-42.00
Cast Steel	41.00-42.00
Punchings	41.00-42.00
Elec. Furnace Bundles.	41.00-42.00
Heavy Turnings	38.50-39.00
Cut Structurals	41.00-42.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-45.00
Malleable	42.00-45.00
Clean Auto Cast	42.00-45.00
No. 1 Wheels	42.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.00
Rails, Rerolling	46.50-47.00
Rails, Random Lengths	45.50-46.00
Rails, 3 ft. and under.	46.50-47.00
Rails, 18 in. and under	47.50-48.50
Railroad Specialties	46.50-47.00
Angles, Splice Bars	46.50-47.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.00-41.00
No. 2 Heavy Melt. Steel	39.00-40.00
Machine Shop Turnings	32.00-33.00
Short Shovel Turnings.	34.00-35.00

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	43.00-44.00
Charging Box Cast	37.00-38.00
Heavy Breakable Cast.	35.00-36.00
Brake Shoes	38.00-39.00
Clean Auto Cast	43.00-44.00
Burnt Cast	35.00-37.00

Railroad Scrap

R.R. Malleable	54.00-55.00
Rails, Rerolling	47.00-50.00
Rails, Random Lengths	42.00-43.00
Rails, 3 ft and under	43.00-45.00
Uncut Tires	43.50-44.50
Angles, Splice Bars	43.00-44.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$36.00
No. 2 Heavy Melt Steel	36.00
No. 1 Busheling	36.00
Nos. 1 & 2 Bundles	36.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	41.00
Stove Plate	39.00
No. 1 Wheels	36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	37.00
R.R. Malleable	42.50
Axles, Steel	39.00
Rails, Rerolling	41.00
Rails, Random Length.	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars.	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$19.04
No. 2 Heavy Melt. Steel	*19.04
No. 1 Busheling	*19.04
Nos. 1 & 2 Bundles	*19.04
No. 3 Bundles	*17.04
Machine Shop Turnings	*12.54
Bar Crops and Plate	18.00
Cast Steel	18.00
Alloy Free Turnings	8.00
Cut Structurals	20.00-20.50
Tin Can Bundles	17.00

Railroad Scrap

Axles	26.50
Rails, Random Lengths	21.00
Uncut Tires	28.00

*Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	20.00
No. 3 Bundles	18.00
Machine Shop Turnings	11.50
Mixed Borings, Turnings	11.50
Punchings & Plate Scrap	21.50
Cut Structurals	21.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
Nos. 1 & 2 Bundles	19.50
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	27.50
Elec. Furnace Bundles.	27.00

Cast Iron Grades

No. 1 Cupola Cast	30.00

LOGEMANN

Presses for Sheet Scrap

THE NATION NEEDS YOUR SHEET SCRAP!

In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill Service,* presses *designed for automobile plant conditions,* presses *designed for general plant applications.* Write for details.

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.

LOGEMANN BROTHERS COMPANY
3126 W. Burleigh St. **Milwaukee, Wisconsin**

. . . made of corrosion-and acid-resistant Ampco Metal, they increase pickling-tank output

Big—these hooks weigh 700 lbs. apiece. Tough — they practically live in a 140° F. bath of 6% sulphuric acid without any ill effects.

You see, these hooks are made out of corrosion- and acid-resistant Grade 18 Ampco Metal. That is why they carry out their rigorous job day after day — why their trouble-free performance reduces down-time and increases pickling-tank production.

Although you may not have need for pickling hooks such as these, remember: If you are faced with corrosion, erosion, abrasion, or cavitation problems — if you have to handle such liquids as acids, petroleum sludge, alkaline solutions, sea water, mine waters, hot brine, or food-product liquors, Ampco Metal is the answer.

Available in seven grades, this engineered aluminum bronze alloy can be obtained in the form of castings, forgings, sheets, and rods. It is without equal for low-cost corrosion- and acid-resistant fabricating.

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AMPCO
Metal
The Metal without an Equal

P-17

Sheets, Strip . . .

Base prices advanced $6 to $8 a ton . . . Electrical sheet extras revised

Sheet Prices, Page 138

Pittsburgh—One major steel producer last week issued a new extra card, effective Aug. 1, on electrical sheets incorporating certain revisions. Except where noted, the following extra charges have been put into effect by one or more producers since base prices and extras were revised last January. The new card includes extras for maximum individual coil weight (only applicable when the customer specifies coils not to exceed a specific pounds-per-inch width) as follows: 100 lb per in. width of coil and over, no charge; under 100 lb to 66 lb, 25 cents; under 66 lb to 50 lb, 50 cents. An extra for greased edges of 5 cents, as on other sheet products, has been incorporated in the card; also pickling after annealing extras (applying on all grades) have been revised to include cut lengths as follows: 17 gage and heavier, 70 cents; 18 to 21 gage, 80 cents; 22 to 24 gage, 90 cents; 25 to 27 gage, $1; 28 to 30 gage, $1.25. The seller assumes no responsibility for rusting and recommends oiling be specified.

A new extra of 10 cents has been established for separating inside from outside sheets; also, new packaging extras have been put into effect to bring them in line with those applying on hot and cold-rolled sheets over 12 in. wide, and on cold-rolled sheets over 12 in. The new packaging extras now apply for cut lengths only.

Length brackets have been revised as follows: Over 124 to 144 inches, 124 to 96 inches, inclusive, under 96 to 60 inches, under 60 to 48 inches, and under 48 to 30 inches. The length extras for the new brackets 60 to 48 inches are 21 gage and heavier, 10 cents; 22 to 27 gage, 15 cents; 28 to 30 gage, 20 cents.

An item quantity extra of 10 cents is now charged for under 10,000 to 6000 lb.

The new card includes the following declaration as to what constitutes commercial quality: "Electrical sheets are sold to a maximum core loss for the various grades and thicknesses in the range of 22 to 29 gage as shown in the published tables, for maximum core loss for thicknesses other than those carrying maximum core loss values. The sheets are processed for the magnetic properties consistent with the thickness, grade and application. Electrical sheets are produced to give the best physical properties possible compatible with the grade and its normal magnetic properties. The use of silicon in electrical sheets and the processing required to develop the necessary magnetic properties are basic requirements of these sheets and may cause fabrication difficulties. Electrical sheets are normally supplied with a thin surface oxide without further treatment after final annealing. Unless ordered otherwise, such as core plated pickled after annealing, etc., any operation after annealing which may be specified by the purchaser for the purpose of improving flatness, increasing stiffness, etc., such as temper rolled after annealing operation, are at the risk of the purchaser. Before performing such ordered operation, the sheets will be normaled for the grade with the core loss not exceeding the maximum

value for the grade and gage. The seller assumes no further responsibility for the magnetic properties of the material after such operation. Generally, such operations not only are ordered when the lamination, punched or sheared from the sheets, are annealed by the buyer. When such annealing operations are properly conducted, the original magnetic properties are usually restored."

American Rolling Mill Co. has discontinued Middletown, O., as a base on hot-rolled sheets, substituting Ashland Ky. This interest has raised cold-rolled paint grip and zinc grip quality sheets $8 and $10, respectively; also increased size extras equivalent to 1½- cents on aluminized sheets and reduced base price equivalent amount. Sharon Steel Corp. raised hot and cold-rolled strip items in line with above and in addition advanced cooperage hoop prices $6 a ton to a new base of $3.10 per 100 pounds. Nearly all producers have increased pickling extras 5 cents to 25 cents.

New York—Sheet sellers are beginning to set up quotas for fourth quarter, and apparently on a basis showing little or no improvement over allotments in the current quarter. Most sellers will have a carryover of at least a month, about the equivalent of the average carryover at the beginning of the third quarter. Most producers are planning on making about the same allocations for car construction and housing that they did for this quarter.

The price situation continnues in a state of flux. Various producers have advanced hot roll sheet $6.00 a ton, cold rolled sheets $7.00 and galvanized sheets $8.00, with others still to be heard from.

Some sellers have also announced increases in enameling stock at $8.00 a ton, while at leaast one has announced an increase of $6.00 a ton on medium and low grades of electrical sheets. There is some question as to whether there will be any change in stainless sheets at this time, especially in view of sluggish demand for this material.

New York—Most sellers of narrow cold-rolled strip have as yet taken no action on prices, preferring to let the situation settle a bit before setting up new schedules. In general, demand is none too active, with backlogs somewhat smaller than they were a month ago However, more sellers are well booked for the remainder of the year and at last one seller has opened books for the first quarter of next year. So far though he has found little interest among consumers in that position.

St. Louis — Sheet production continues to gain here, with operations last week reaching 90 per cent of capacity. The month of July, however, will not average out better than 60 per cent, due to a strike and the necessity of refilling plant pipelines. Books remain closed with schedules filled through December. Demand for hot and cold-rolled sheets is unabated, wih no order cancellations reported even though deliveries are months behind. Only change on order books are occasional specification changes. Announcement of price increases has been delayed until mills can compute new costs—a task complicated by constantly fluctuating scrap prices. New quotations now are expected to be $6 higher on hot rolled sheets. Steel producers in this district are attempting to determine prices on a strictly local basis, but still within the general competitive pattern established by the big mills elsewhere.

Cincinnati — District sheet mills found no consumer resistance after annoucing

. . . just one of the ten points of superiority of Horsburgh & Scott single, double and triple reduction Herringbone Speed Reducers . . . in ratios from 2.31 to 1 up to 429 to 1.

● These features insure quiet, smooth operation with maintenance cost close to the zero point and exceedingly low depreciation, even under very heavy shock loads and other difficult conditions of service.

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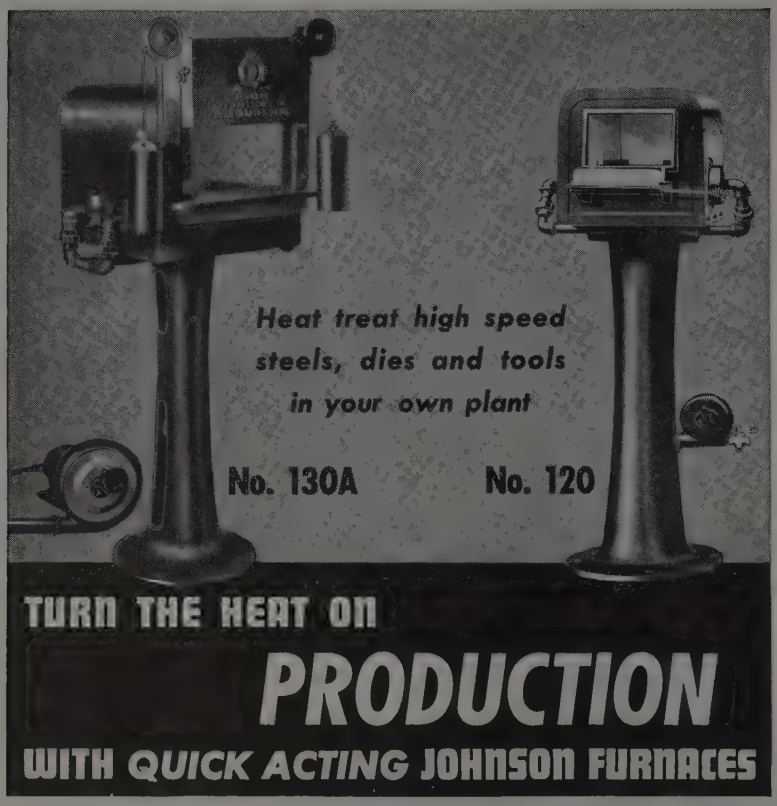

No wasted time with JOHNSON Hi-Speed No. 130A

This Quick Acting Johnson Furnace is available in two temperature ranges. 4-Burner Unit for steels requiring 1400 to 2350°F. or 6-Burner for 1800 to 2400°F. Gets the job done before conventional type furnace warms up. Powerful burners fire under hearth to assure maximum uniform heat. Saves time and gas. Counterbalanced door opens upwards. Firebox 7¾x13x16½ lined with high temperature insulating refractory. Complete, ready for action with Carbofrax hearth, G. E. motor, and Johnson blower.

4-Burner Unit, $295.00 6-Burner Unit, $325.00
F. O. B. FACTORY

1500°F. in 5 Minutes — 2300°F. in 30 Minutes with JOHNSON Hi-Speed No. 120

Compact, powerful, and remarkably low in operating cost this Quick Acting Johnson Hi-Speed Furnace is easily regulated to harden ANY steel tools or dies. Also used for heat treating small metal parts. Two powerful burners fire under hearth to assure fast uniform heat. Gets the job done FAST to save time and gas. Firebox 5 x 7¾ x 13½ lined with high temperature insulating refractory. Complete with Carbofrax hearth, G. E. motor and Johnson blower.

$145.50 *F. O. B. FACTORY*

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price increases which had been generally anticipated. Andrews Steel Co. boosted galvanized and long ternes $10, and electrical sheets $6. Increase of $8 on hot-rolled was on Newport, Ky., base. (No cold-rolled). Fourth quarter schedules are being drawn by district mills, showing that demand is persistently far in excess of output.

Birmingham—Allocation of sheets continues. Fourth quarter allocations probably will be made during the week, but there is nothing to indicate any increased tonnage for consumers except in scattered instances and then probably at the expense of someone else. Order backlogs are said to be heavy.

Chicago — Consumers of steel sheets and strip are accepting news of the price increase, $6 on hot-rolled and $7 on cold-finished, calmly, although the majority of users believe they will have to pass along the increase. The price change is expected to have no effect on crowded mill books. Some producers believe the $8 increase on galvanized sheets is inadequate. One mill has been running in the red on its galvanized tonnage for the past several months and believes this item should have taken a $12 increase. With the higher price, galvanized flat-rolled will continue a low-profit product and no improvement in the supply situation can be expected.

Philadelphia — With sheet mills now beginning to allocate tonnage to their regular trade for shipment in the fourth quarter, indications are that consumers will receive no more than they did in the current period. Some consumers regard recent price advances as too sharp, but nevertheless would pay the higher prices for far more steel than they are likely to receive. An increase of $6 a ton at Sparrows Point, Md., base brings the base there on hot-rolled sheet up to 2.80c with a delivered price at Philadelphia of 3.00c.

The Conshohocken, Pa., producer has advanced his price $6 a ton to 3.40c, Sparrows Point equivalent.

Galvanized sheets have been advanced $8 a ton at Sparrows Point to 3.95c with the delivered price at Philadelphia from that point now 4.15c. Some mills are currently quoting 3.93c, delivered Philadelphia on cold-rolled sheets.

Structural Shapes . . .

Structural Shape Prices, Page 139

New York — While considerable structural work is being figured, the sharp upward trend in steel prices has caused some tonnage, especially public work for which appropriations have already been made, to be withdrawn. New awards locally over the past week have been rather light.

Structural bookings in June, according to the American Institute of Steel Construction Inc., amounted to 94,602 tons, a decrease of 24.8 per cent under the average of 125,835 tons booked in the same month in the average five prewar years 1936-1940. Bookings for the first six months of the year, however, amounted to 732,477 tons, still showing a gain over the 691,271 tons booked in the same five months in the prewar years' period.

The June total compared with revised totals of 110,180 tons in May and 147,207 tons in April.

June shipment of 133,024 tons continued at the rate established in the

first six months of this year and brought the total up to 825,413 tons. Tonnage available for fabrication as of June 30 was 643,209 tons.

Philadelphia — The leading eastern Pennsylvania producer has advanced structural shapes $6 a ton to 2.80c, Bethlehem, Pa., with delivered prices at Philadelphia and New York now 2.94c and 3.00c, respectively.

Chicago — Demand for structural shapes from the Midwest flood areas continues strong and several weeks will be required to evaluate the tonnage needed for repair and reconstruction. Prominent among pending business is a new bridge over the Mississippi river at East St. Louis which will take several thousand tons of various size shapes. Shipments to carbuilders are continuing in excess of the voluntary allotments.

Birmingham — Although scattered shape requirements are for a considerable aggregate tonnage, shape business is almost as prospective as it is current with large bookings likely to appear within the new few weeks. A scattered volume of construction is evident in the district. Together, it represents quite a large demand. In the making, though, is an even bigger need if some of the larger projects materialize.

Seattle—Fabricating plants are working on fair order backlogs and are unable to bid on larger projects because of continued shortages of material. Mill allocations are insufficient for the needs of this area and no immediate easing is in prospect. Rush mill shipments are being routed overland; the heavier tonnage, by water.

Steel Bars . . .

Bar Prices, Page 138

New York — Most hot rolled carbon bar sellers have opened their books for fourth quarter, with allocations on an average a little more liberal than for the current period. With few, if any, exceptions sellers of cold-drawn bars have long since been accepting orders for delivery late in the year, the stringency lying only in the very small sizes. Likewise, sellers of alloy bars, both hot and cold, have long since been quoting on tonnage for future shipment, as demand has been relatively sluggish. In fact, deliveries can be had on hot alloy bars for shipment within four to five weeks.

Most mills have announced a $6.00 a ton increase on hot carbon bars, quoting delivered price here of 3.31c. Higher prices are also being announced in some quarters on cold drawn carbon bars and cold drawn alloy bars. Some leading independents have advanced cold carbon $7.00 and cold drawn alloy $6.00.

St. Louis — Small size merchant bars continue in tight supply. Some mill consumers complain they are being seriously squeezed in the competition with big ones to obtain bar shipments or even places on rolling schedules. Mills are booked at least five months ahead and are declining new orders. Most seek to keep 1948 books closed until the scrap, pig and price situations are clarified. Bar mills are averaging 95 per cent of capacity, with occasional setbacks due to scrap scarcities or delayed iron deliveries. Mills were attempting last week to determine the extent of bar price increases necessary. In this district the prices of

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oil, gas and scrap enter in, which may delay computations a week or two.

Pittsburgh — Republic Steel Corp., Wyckoff and American Steel & Wire Co. raised cold-finished bar prices, and it was indicated other members of the industry would soon take similar action in advancing prices $7 per ton on carbon and $6 on alloys. This interest raised hot-rolled alloy, also merchant and concrete carbon bars $6 per ton, and similar action was taken by Jones & Laughlin Steel Corp. on merchant and concrete bars. Cold-finishers were holding up price action until official details as to Carnegie's price move were known.

Philadelphia — An advance of $6 a ton has brought the delivered price at Philadelphia on hot-rolled carbon bars to 3.28c per pound. Despite the increase, demand continues brisk, and with the mills in a little better position to handle tonnage, particularly the medium and large sizes, more will be available to buyers in the fourth quarter than at present.

Seattle—Rolling mills are booking a large volume of new business in small tonnages, averaging 20 to 50 tons in bars. New orders are about equal to production, consequently order backlogs remain virtually stationary. Plants are operating at capacity. Demand for merchant bars, as well as reinforcing bars, continues strong, since public works, industrial and business construction remain at a high level.

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American Steel & Wire Co. Revises Price Schedule

Cleveland—American Steel & Wire Co. has announced the following new delivered prices for products within the range of sizes, grades, finishes and specifications currently produced at its plants. These prices will apply on carload lots and were effective with shipments made on and after Aug. 1. The prices per 100 pounds are on the basis of fob cars, delivered within switching limits: Cold-finished bars, $3.60, Pittsburgh, Chicago and $3.59 Cleveland; hot-rolled strip, $2.85, Pittsburgh and Chicago, $2.84, Cleveland, and $2.97, Worcester, Mass.; galvanized nails, $4.05, Pittsburgh and Chicago; all other nails and staples, $4.30, Pittsburgh and Chicago, $4.62, Worcester.

Prices on the following products will be increased in the amounts per ton indicated: Cold-rolled strip, 0.25 carbon and under, $7; manufacturers wires, not including fine and specialty, $5; barbed and twisted wire, $7; galvanized farm fencing, $7; bale ties, $5.

Where delivery by truck is required by customer and cost of such transportation exceeds applicable published rail rate, the additional cost shall be for customer's account. Delivered prices to other destinations within the United States will be quoted on request. Prices are subject to seller's current list of extras and standard conditions of sale. All prices are subject to seller's prices in effect at time of shipment.

Wire . . .

Wire Prices, Page 139

Pittsburgh — Jones & Laughlin Steel Corp. has advanced galvanized nails $5 per ton, standard and cement-coated nails $10, and polished and galvanized staples $10; making new price on galvanized nails $4.00 per 100 pounds and $4.25 for other items. Bright wire, basic or bessemer, has been increased $5 a ton to new base of $3.55 per 100 pounds by J&L; while Pittsburgh Steel Co, is reported to have made a similar price adjustment over its premium price to $3.80. Other interests soon are expected to follow above price revisions which in addition raised field and poultry fence, 15.5 gage and coarser, and galvanized barbed wire about $7 a ton; also annealed and galvanized merchant quality wire $5 a ton.

Pittsburgh—Although official action has not been taken, Pittsburgh Steel Co. is expected to raise wire rods, galvanized nails and bright basic wire $5 a ton; standard nails, $10.

Chicago—Wire and wire products are vieing with flat-rolled carbon steel for top place among critical steel products in this district. This is due to a considerable extent to the seasonal demand for fencing, screen, bale ties and merchant wire. Some plants producing these items have foregone scheduled summer vacation shutdowns in an attempt to catch up with demand. Distributors are reported

able to sell wire product allotments out of railroad cars without warehousing them.

Birmingham — No signs of easing are seen in the tight situation in wire. Jobbers declare demand for some wire products, especially nails and fencing, seems to be unlimited. One of the district's biggest outlet sources said the major headache of his organization is equitable distribution to retailers of "anything made of steel." Fencing for farm repair work also is in heavy demand.

Plates . . .

Plate Prices, Page 139

New York—Most plate mills have announced sharp increases in prices. Due to raw material shortages and mechanical difficulties, this mill is far behind on schedules and has enough tonnage on hand to keep it operating over the remainder of the year at its reduced average rate of operations.

The leading seaboard producer has advanced prices $6 a ton to 2.95c, Sparrows Point, Md., or 3.24c delivered New York.

Within the past few days, the Coatesville, Pa., producer has advanced prices $7.00 a ton for both carbon and alloy steel plates, bringing its base on the carbon up to 3.15c. The Claymont, Del., mill has advanced its price $5.00 a ton, although from a higher base which brings its present price also up to 3.15c. This producer also has advanced its fas export price $5.00 a ton to 3.75c.

The Conshohocken, Pa. producer has advanced its gage differential on lighter and in addition has advanced its base $7 a ton to 3.15c, Coatesville and Claymont equivalent.

Some mills, quoting on a quarterly basis, are now setting up quotas for a fourth quarter; some, in fact, have long since set up allocations for car builders for that period. Still others, who have not been selling on such a basis, but who have been accepting orders where attractive for future shipment, have little space available for new tonnage this year. At least two mills declare they are sold out completely.

Foster-Wheeler Corp. and M. W. Kellogg Co., this city, have received contracts for the construction of two major units of the new refinery which the Texas Co. is building at Eagle Point, N. J.

Philadelphia — The leading eastern plate producer, having advanced prices $6 a ton, is now quoting 2.95c, Sparrows Point, Md., which compares with 3.15c, Coatesville, Pa., and Claymont, Del., as now being quoted by producers at those points and by the Conshohocken, Pa., producer. Another eastern Pennsylvania producer advanced prices $6 a ton to 4.15c, basing points. This represents a premium price which has been in effect for a long time. The Coatesville and Conshohocken mills advanced their quotations on plain carbon plates $7 a ton and the Claymont seller, $5. The Conshohocken producer, a few days earlier, also advanced the gage differential 30 cents per 100 pounds on thicknesses under ¼-inch. This interest also advanced prices on floor plates $6 a ton from 3.90c per pound to 4.20c, Pittsburgh and Chicago basing points.

With a mill price of 2.95c, Sparrows Point continues to be the covering base on plate shipments here, with a delivered Philadelphia price of 3.15c. This figure is

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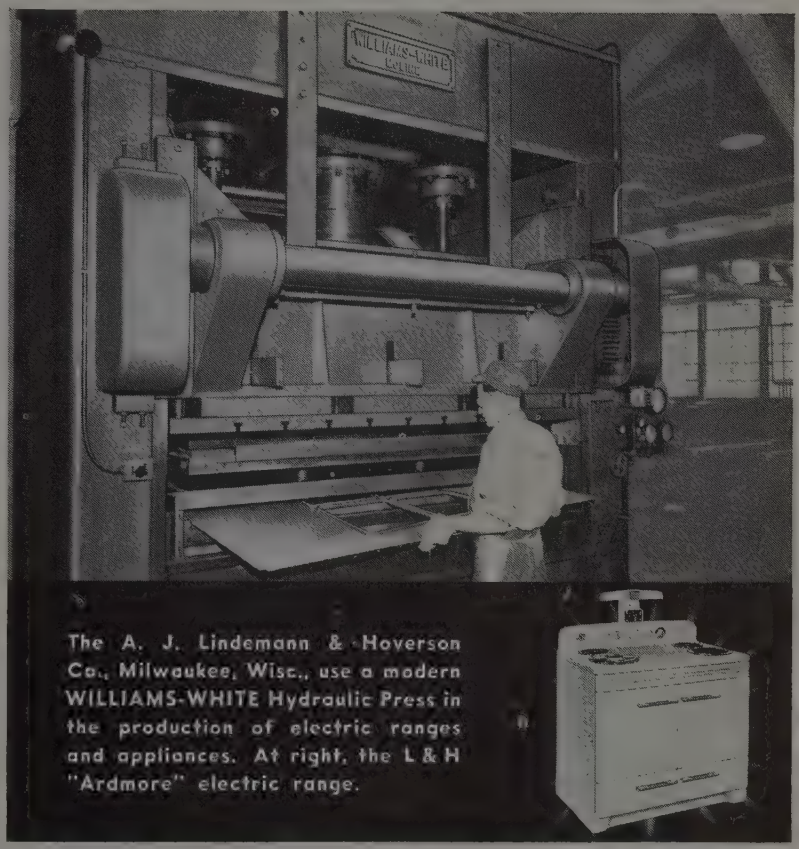

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being met by certain mills away from the seaboard, but none within the district.

Pittsburgh — Leading interests here have advanced carbon steel prices $6 a ton to a new basis of $2.95 per 100 pounds, although there are some exceptions among some producers such as Lukens Steel Co. which raised its Coatesville, Pa., base price $7 a ton or to $3.15 per 100 pounds, while Alan Wood Steel Co. raised its light plate prices (under ¼-inch) $6 a ton. No price announcements yet have been made on floor plates. Similar price advance of $6 a ton to a $2.80 for 100 lb basis has been established by most producers on structural shapes.

Birmingham — Car building requirements, with stepped-up production at the Bessemer plant, along with miscellaneous requirements, keep the plate situation in the South tight. Backlog orders are voluminous. Refinery needs are adding considerably to local demand.

Seattle—Plate fabricators are confining operations to contracts involving small tonnages. Scarcity of sheets is a critical problem, substitutions being frequently necessary. Small tanks and pipe jobs predominate. Plants report mills are hesitant in covering large commitments so that fabricating operations are restricted.

Tin Plate . . .

Tin Plate Prices, Page 139

Pittsburgh — No price adjustment on tin mill products is indicated until later this year, at which time contract prices for the full year 1948 will be established. On the basis of increased production costs, as reported by National Steel Corp., higher tin plate prices seem inevitable for next year. This interest reports that production costs have risen 75.75 per cent since March, 1939, while selling prices are up only 33.76 per cent. Effect of increase in tin plate prices on the operating cost of consumers is said to be negligible. It is estimated that a $1 increase per base box of tin plate would mean but a quarter-cent increase in the cost of making containers. Sellers are experiencing a sharp increase in pressure for early deliveries and there is considerable effort on the part of consumers to obtain additional tonnage in anticipation of the indicated price advance for next year.

Tubular Goods . . .

Tubular Goods Prices, Page 139

Pittsburgh—Effective on shipments on and after Aug. 7, Pittsburgh Steel Co. will advance oil well tubing, drill pipe and casing up to an average increase of 25 per cent over 1937 price levels. In analyzing cost factors, this company states production costs for the first six months of this year over those for 1937 are as follows: Coal, up 137 per cent; scrap, up 110 per cent; labor, up 105 per cent; fuel oil, up 60 per cent; and freight of inbound shipments, up 25 per cent. As long as present cost factors remain constant and full mill operations are permitted, the company plans to produce at maximum capacity of oil country tubular goods under these new price schedules.

Other producers also are expected momentarily to follow upward average price revision in black pipe of $7 and $10 a net ton for galvanized announced recently by Jones & Laughlin Steel Corp. and Wheeling Steel. Oil well tubing and casing is up between $7 and $8 a ton. Although no price action yet is reported, seamless and electric weld mechanical and pressure tubing are expected to be advanced within range of 7½ to 10 per cent. New discount cards should be available early this week.

National Tube Co. advanced pipe and tubing prices about 7½ per cent, effective Aug. 1.

Youngstown — Price advances ranging from $5 to $13 a ton were announced last week by Youngstown Sheet & Tube Co. on standard steel pipe and oil country goods. New prices showed the following increases for black and galvanized, respectively, standard steel pipe: $5 and $8 for 2½ inch to 3 inch; $6 and $9 for 2 inch; $8 and $11 for 1½ inch; $9 and $12 for 1 inch; $10 and $13 for 3/4 inch. On oil country goods, the advances ranged from $6 to $8 a ton.

St. Louis — Demand for pipe, long under pressure from housing, is increasing sharply here due largely to manufacturers of commercial and residential radiators. Calls from freight car builders have been on the upgrade recently as their production improves. Laclede Steel Co. here has given Washington an unofficial pledge to supply virtually all the pipe needed by car manufacturers in this district, and so far has met the promise. Pipe schedules are filled to the end of the year and producers are rejecting all but emergency orders and declining to quote delivery dates on those. Operations are at 95 per cent of capacity, with no increase probable until raw material supplies ease.

Seattle — There is no improvement in the cast iron pipe market, deliveries being extended 20 months or more. Demand continues strong, but other types of pipe are making inroads into the cast iron field.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 139

Cleveland—Bolt and nut producers have inaugurated a new study of costs and selling prices in view of the advance in bar, wire rod and wire prices. Several large producers made firm price commitments for third quarter delivery in an effort to stabilize the market a short time ago and, therefore, will be unable to make any revision effective prior to Oct. 1. Some of the smaller producers may be forced to take earlier action. Although production has been curtailed recently due to smaller receipts of raw materials from plants that have been closed for vacations or that operated at a slower rate early this month due to the coal crisis, some producers have reduced order backlogs as much as 10 per cent since the first of the year. Inventories of raw materials are getting far out of balance since mill shipments of individual lots have been larger while the overall tonnage has remained about the same. While deliveries on large-diameter and long-length items are extended 3 to 4 months, those on the smaller sizes are extended 12 to 16 months. One of the products in tightest supply and heaviest demand is sheet metal screws.

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Pig Iron . . .

Pig Iron Prices, Page 140

New York — Price of pig iron here depends largely upon the source of supply. While most producers have advanced their prices $3.00 a ton, at least one easte n seller has advanced his selling price $3.50 and another, early in July, $6.00 and on an fob furnace basis.

Foundry melt for the month just ended is down rather substantially from June, due primarily to suspensions for vacations. The trade generally anticipates some improvement in August, although seasonal conditions may continue to retard prduction, to say nothing of continued shortage of pig iron, coke and scrap.

Philadelphia — With scrap prices substantially higher than pig iron, a reversal of the normal position, pressure for iron continues greater than ever. However, allocations for August are about on a par with those for July. The continuing upsurge in scrap prices may result in still higher prices eventually for pig iron. Meanwhile, foundry coke is becoming increasingly scarce, and higher prices along the seaboard may be announced shortly.

Philadelphia — The Jackson, O., silvery pig iron producer has advanced the base price $3 a ton to $45.50, fob Jackson, and has increased the differential for each additional 0.50 per cent silicon to $1.25 from $1 previously.

Chicago — Inland Steel Co. has blown in its No. 8 blast furnace, a DPC unit not previously operated. The stack will produce basic iron. Furnace has a height of 100 ft 11 in., hearth of 25 ft 9 in., and bosh of 28 ft 9 in. The district now has 42 blast furnaces of which 39 are in operation.

Merchant pig iron continues extremely tight. New prices are in effect throughout the district. Keokuk Electro-Metals Co. has advanced prices for electric furnace silvery to $74 for piglets and $72 for open-hearth and foundry grade, Keokuk, Iowa.

Buffalo — Foundry demand for pig iron is reported less urgent, due in some measure to increased resistance to high prices for castings. Merchant producers, however, see no immediate prospect of a surplus and August bookings call for shipment of full output. A further advance in coke prices, on the heels of a $1.11 increase July 1 by one of the leading local producers of foundry fuel, is widely anticipated. Oven foundry coke is being delivered from other districts at $18.25, an advance of $2.15.

Pittsburgh — Reflecting a $3 a ton price advance in merchant pig iron and exorbitant high level of prices for cast scrap items, foundry interests in this area are expected to advance castings prices 10 to 15 per cent around the first of this month. In addition to the above, foundry operating costs have been increased by recent advance of $2 to $2.50 in foundry coke prices, plus the fact that quality of coke remains well below normal.

Pig production is back to normal with only 2 out of 47 furnaces now idle in this district. Despite practical capacity pig iron production in this area, very little iron is available for the merchant trade. Very acute shortage of coke, scrap and pig irn for the foundry trade is indicated through most of this year. Electric furnace silvery pig iron prices have been advanced $5 per ton at Jackson, O., and Niagara Falls, N. Y., and blast furnace

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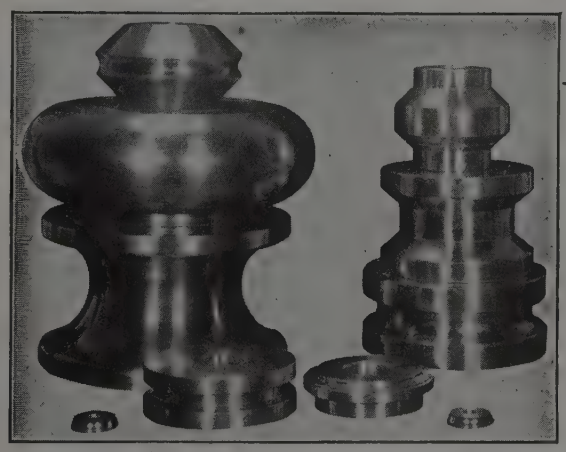

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silvery pig iron $3 a ton, Jackson, O.

Effective Aug. 1, Tennessee Products Corp. raised charcoal pig iron prices $1 a ton to $44, fob furnace, Lyles, Tenn.

Cincinnati — Shipments of pig iron into this district recently improved as furnaces aimed toward fulfillment of July allotments as output tended upward. Stocks of melters are low despite conservation by use of a heavy proportion of scrap. Inquiries indicate foundries are in position to expand the melt if more iron and coke becomes available.

St. Louis — Although pig iron output has been at 100 per cent of capacity several weeks, producers are unable to dent the demand. Early last week there was danger of a "mourning" shutdown, following the West Frankfort mine disaster, among the southern Illinois coal mines supplying Koppers here which might curtail iron production. Koppers had a 10-day supply of coke on hand and expectations were coal mining would resume before that was exhausted. Ore supplies are under contract for a year and deliveries are on schedule. Outlook for continuing capacity production in the months ahead is favorable, with the result some sources predict easier iron supplies in the near future. Half the local capacity currently is on basic and the other half on foundry. Following the recent pig iron rise, quotations on the Granite City, Ill., base are: No. 2 foundry, $37; basic, $36.50, and malleable $37.

Birmingham — "Terrific," was the only word a local merchant iron melter said he could find this week to describe pig iron demand. The recent price increase was expected. It was made applicable up and down the line with little or no comment except from blast furnace interests who said it didn't cover recent cost increases.

Seattle — Pig iron bookings are now being confirmed at the new delivered price here of $41.60 for No. 2 foundry grade, effective July 23. Supplies are still short, with demand in excess of material available. Dealers expect less volume in view of the higher prices. Some foundries require pig iron at any price, but the increased price is expected to stimulate the use of cast iron scrap which is a better buy at going prices, especially for the smaller plants and gray iron foundries.

Scrap . . .

Supply fails to improve materially despite continued price advance

Scrap Prices, Page 144

Pittsburgh — Further upturn in scrap prices developed here last week and there was no indication that the latest upward surge in prices had run its course. Toward the close of the week sales of heavy melting steel at $42 were transacted, with rumors that at least one interest was paying as high as $45. The latter figure is substantiated by one large broker who said he is willing to pay but is unable to locate any substantial tonnage for $44.50. Mills in surrounding districts are said to be paying between $47 and $50 for heavy melting steel, some of which tonnage is slated for special ingot melting deals.

One regrettable feature about the steady upward price trend is that no significant improvement in supply appears to be developing. Some authorities expect the present price-supply situation to continue for months ahead and hold it is imperative that government authorities take more active steps in stimulating return of battlefield scrap.

Some brokers obtained heavy melting steel on the recent Pennsylvania railroad list at $42.78, railroad specialties at around $48. Much of this tonnage was allocated at below bid prices. Turnings are stronger with sales at 50 cents to $1 above former quotations.

Higher pig iron prices have bolstered cast scrap market (not that it was needed) with some sales reported around $45, although bulk of tonnage continues to move around $43. Low phos punchings and plate scrap have been sold at $43 to $45.

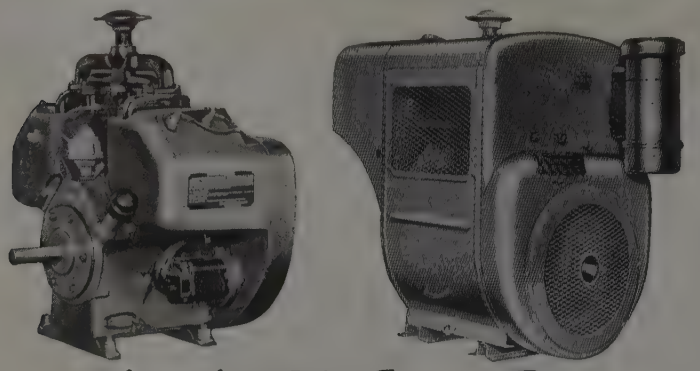
Philadelphia—The upswing in steel scrap is losing some of its momentum. In the cast grades, prices are virtually unchanged for the first time in recent weeks. No. 1 and No. 2 heavy melting, No. 1 busheling, and No. 1 and No. 2 bundles are higher at $40 to $41, delivered; No. 3 bundles, $37 to $38; machine shop turnings and mixed borings and turnings, $31.32; cut structurals, $42 to $43; heavy turnings, $40 to $41; and chemical borings, $34.50 to $35.50.

New York—Brokers' scrap buying prices were unchanged here last week for the first time in several weeks. However, demand was still active and there were no indications yet of the market having reached a peak.

Cleveland — Heavy melting steel scrap prices have advanced about $3 a ton in this district to a nominal quotation of $41.00 to $41.50. Mills remain out of the market, however, since receipts of material are equal to or in excess of consumption. In addition to the flow of scrap from brokers, customer scrap is returning in large volume. Part of the latter tonnage usually moves to steel foundries and this has resulted in a tighter supply and stronger price situation in foundry grades. Recent sales of heavy melting steel scrap here have been for the account of Mahoning Valley mills, the latest having been at $42.50. The market in the Valley is now quoted $42.00 to $42.50. The higher price levels account for the improvement in shipments during the past week or two.

Cincinnati — Scrap prices are up $2 in a strong and turbulent market. Some district melters have fair inventories of scrap, yet all are anxious for tonnage. The higher prices so far have failed to bring out an increase in volume, but market interests are uncertain whether there is any considerabe holding of scrap on speculation.

Buffalo — Fresh business in the scrap market last week was restricted, as both sides were playing a waiting game. Meanwhile, prices climbed another dollar in the steelmaking division. Dealers were reported holding back, endeavoring to catch the peak of the current price upsurge. Despite these delayed tactics, yard stocks are still short of normal, reflecting light receipts from collection sources. On the buying side, consumers also were cautious. Obviously the psychology is to check the price advance with a falling off in buying interest. A



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further rise developed as top offerings of No. 1 heavy melting were sold to a mill consumer within a range of $42-44. Prices on No. 2 material annd bundles reached $39-40, but tonnage was negligible. Reports that Youngstown-Pittsburgh buyers had made purchases in this area on the basis of $41.50 for No. 2 heavy melting and bundles also supported local prices. An increased volume of reciprocal deals is partly to blame for lack of surface offerings. Stiffer tendencies also were noted for cast grades. Cupola advanced $3 to $5 a ton to a range of $40-42. With offerings hard to find, malleable reached a range of $50-52. Approximately 3000 tons arrived from the seaboard by barge, but water receipts to date this season have been lagging

Chicago — Scrap prices continue firm at the higher levels announced a week ago. The new prices have brought out a fair amount of material but not enough to weaken the market. Reports still are heard of sales at higher than quoted prices, with some cast scrap said to be moving at as high as $50 and malleable at widely varying prices.

St. Louis — Scrap shipments continue slow under current price uncertainties. Mills complain brokers are ignoring earlier, low-priced contracts as prices rise while brokers say they are attempting to fill them even at a loss, but shipments prevent it. Mill and foundry stockpiles are the lowest in some time, with foundrymen becoming apprehensive of curtailed operations Few of either have better than a month's supply, regarded as the danger point. Scrap returned to mills by steel customers is increasing, but the tonnage is not great enough to offset the scarcity in brokerage channels. Even though short, the local supply of scrap is considered better than the national situation.

Birmingham — Posted prices on local scrap didn't change this week, but they apparently didn't mean a great deal. Reports were heard in the district of scattered purchases of melting steel at $38 to $40 as against a quoted $36. But even so, scrap remains scarce. Some observers believe it will go even higher.

Seattle — Steel scrap supplies are tight, dealers claiming that sources of supply are failing to yield the amount anticipated. Demand continues extremely heavy. Increased consumption in this area is the basic factor in the tight situation. Practically all of the supply in Portland, Oreg., is being absorbed by one mill in that city; consequently, little or no material is being shipped out of that area. Shipbreaking plants are hoping that additional obsolete ships will be released to relieve the situation.

Warehouse . . .

Warehouse Prices, Page 141

Pittsburgh—Steel distributors have not yet revised their prices in line with recent mill product advances. Due in part to the scrap loss in preparing material for small-lot sales, it appears probable that warehouse prices will be advanced somewhat more than the mill base prices on the respective products. Local distributors are now quoting carbon steel plates at $4.15 per 100 lbs for country delivery and $4.30 for city delivery, to reflect change in policy of including in the base price the 5-cent extra for ASTM: A7-46 specification, which quality represents the bulk of their plate sales.

Distributors are under heavy pressure for deliveries, reflecting effort on the part of consumers to obtain as much steel as possible before the anticipated price increase becomes effective. There is some question at this time as to how distributors will handle the price advance in regard to effective date. Normally warehouse interests apply mill increases to their products soon after such advances are made by the mills. In other words, steel distributors' pricing policy has been to accept orders at prices in effect at time of shipment and therefore are subject to change without notice. However, due to the extended truck strike in this district (going into its tenth week) many warehouse steel customers have not been able to receive shipment on orders booked early in June. Because of this local situation the new prices may become effective only on new orders as of a certain date.

Chicago — Warehouses have advanced prices only to the extent of the mill increase and have not changed the warehouse spread.

Warehouse supplies continue extremely tight in all the common products, notably hot and cold-rolled sheet and strip, galvanized sheets, small sized carbon bars, most tubular goods, and wire. Wire products are so tight that some warehouses are selling direct from freight cars. Galvanized sheets are almost impossible to obtain and distributors fear the $8 increase on this item will be inadequate to encourage mills to allocate more steel to the galvanizing plants.

New York—While leading New York district jobbers have not completed revision of their price schedules, they have advanced certain grades. Delivered prices here are now: 4.87c for 10-gage hot-rolled sheets, 4.97c for hot-rolled strip and hot-rolled rounds, 5.52c for cold-finished rounds, 4.72c for shapes, 5.92c for carbon plates, and 6.70c for floor plates.

Warehouse business for the month just ended was about on a parity with June, with trading especially brisk on flat-rolled products, small bars and structurals. Business would have been still heavier if inventories had permitted. Distributors anticipate another good month in August.

Philadelphia — A leading jobber here had advanced prices on all major products, following the upswing in mill prices, and others are taking similar action. Increases range from 30 to 55 cents per 100 pounds. Business in July was off somewhat, possibly being down 5 to 10 per cent on an average.

Cincinnati — Jobbers in this district are poised to adjust prices on sheets in accord with recent mill advances. The price level runs second place, in interest, to supplies which are near exhaustion in sheets, plates, and structurals. The inventory position of warehouses has deteriorated during July largely because of slackening in mill shipments.

Seattle — Wholesale jobbers report a steady volume of business in all departments, making it impossible to increase inventories to any extent. The scarcity of sheets continues unabated. Pipe and the smaller sizes of cold-rolled bars are hard to get while the larger sizes of bars are in better supply. Alloy steel products are fairly easy. No seasonal letdown in demand is apparent. Jobbers are preparing new price schedules in line with mill revisions.

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Cleveland, Ohio

AFA Releases Symposium On Foundry Dust Control

American Foundrymen's Association, Chicago, has just released a "Symposium on Foundry Dust Control."

Sponsored by AFA's safety-hygiene and plant equipment committees, the symposium covers hoods and piping for control systems; wet and cloth type and centrifugal collectors; fans and exhausters; and maintenance of equipment.

According to an introduction by W. O. Vedder of Pangborn Corp., Hagerstown, Md., the dust problem in the castings industry has been complicated by accelerated production, new materials and methods and shortages in personnel and supplies.

SAE To Prepare Manual on Standard Drafting Practices

Preparation of a manual leading to standardization of drafting practice in the automotive industries has been undertaken by the Society of Automotive Engineers.

The project is directed by SAE Technical Board, with D. G. Roos of Willys-Overland Motors Inc., Toledo, O., as sponsor. It will be developed by a steering committee of 15, with W. A. Siler of Delco-Remy Division, General Motors Corp., Anderson, Ind., as charirman. Upon publication the data will be made available to the passenger car, truck, bus, engine, tractor, body, and other automotive industries, as well as to engineering schools and colleges.

Need for uniformity became apparent during Word War II when manufacturers discovered that drafting practices differed widely.

Frank Rising Discusses Increased Wages, Costs

(*Concluded from page 76*)

he is feeling much better. He believes he is getting ahead, and so do a lot of other people.

But he is *not* getting ahead. The relative relationships won't change in the long run; after a while you will hear renewed complaints that we will have to do something for the miner. The schoolteacher, the farmer, the business manager, all the rest of the folks will have to struggle to regain that differential, but they will regain it in the long run.

They've got to, or the thing won't work at all. And no matter how you may be dazzled or disturbed by these fancy operations of monopoly unionism and nationwide industrial "patterns," don't forget that it is initiative, energy, risk taking and plain hard work that put more "purchasing power" into the hands of some than of others. It has always been that way. It always will be.

Semifinished Steel . . .

Semifinished Prices, Page 138

Pittsburgh — Rerolling and forging quality billets, blooms and slabs have been advanced $8 per gross ton to $58 and $58, respectively; alloy items are up $5 to $66. Sheet bar prices largely remain on a negotiated basis, particularly among the smaller interests, although one large producer has established the price at $60. At least one interest has advanced skelp and tube rounds $6 ton to $2.65 per 100 pounds and $7 per ton, respectively. Wire rods have been advanced $5 a ton to a $2.85 per 100 pound basis, while Pittsburgh Steel Co. is reported to have advanced its premium price from $2.80 to $3.05. No all producers have yet followed the price revisions outlined above, but are expected to momentarily.

Empire Steel Corp. Raises Electrical Sheets $6 a Ton

Mansfield, O.—Empire Steel Corp. has advanced electrical sheets $6 a ton; long ternes $12 a ton to $4.60 per 100-pound base, Pittsburgh; hot-rolled annealed sheets, 19 gage, from $3.55 to $4.25.

National Tube Advances Pipe Price Schedules

Pittsburgh—National Tube Co.'s price schedules have been revised as follows: Steel pipe and tubing went up 7½ per cent. Advances varied by items and average $7.50 per net ton on oil tubular goods, $7 on seamless standard and line pipe, $7.50 on butt-weld specialty. Seamless carbon tubing went up an average of 7½ per cent; hot-rolled pressure tubing rose 6 to 10 per cent; cold-drawn and hot-finished carbon mechanical tubing rose 4 to 8 per cent; auto tubing went up 6 to 10 per cent and coupling stock, hot-finished and cold-drawn, rose 6 to 10 per cent.

Prices of Rails and Rail Supplies Rise in South

Birmingham, Ala. — Tennessee Coal, Iron & Railroad Co. has increased its price of rails, splice bars and tie plates $5 a ton. Track spikes have been advanced $7 a ton. An advance of $5 a ton also has been made in manufacturers' wire and merchant wire.

Rails, Cars . . .

Track Material Prices, Page 139

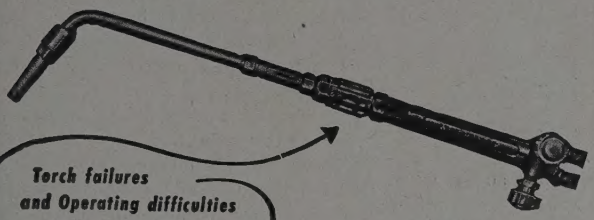
Birmingham — Atlantic Coast Line Railroad this week authorized bids on 4000 new freight cars as follows: 1000 double-door box cars, 1000 single-door box cars, 500 high-side gondolas, 100 low-side gondolas, 500 hopper-bottom coal cars, 100 flat cars, 100 pulpwood cars, 100 port phosphate rock cars, 100 cement hopper cars.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 140

Pittsburgh — Domestic Coke Corp., Fairmont, W. Va., has increased oven foundry coke prices $2 a ton, retroactive to July 10, making price $15.75 per

Does the **TORCH** *You Use have this* Meco *Advantage?*



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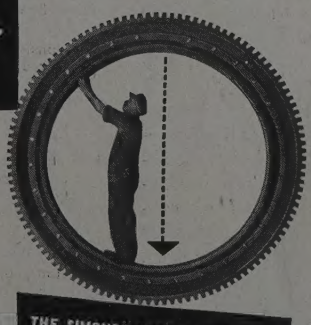

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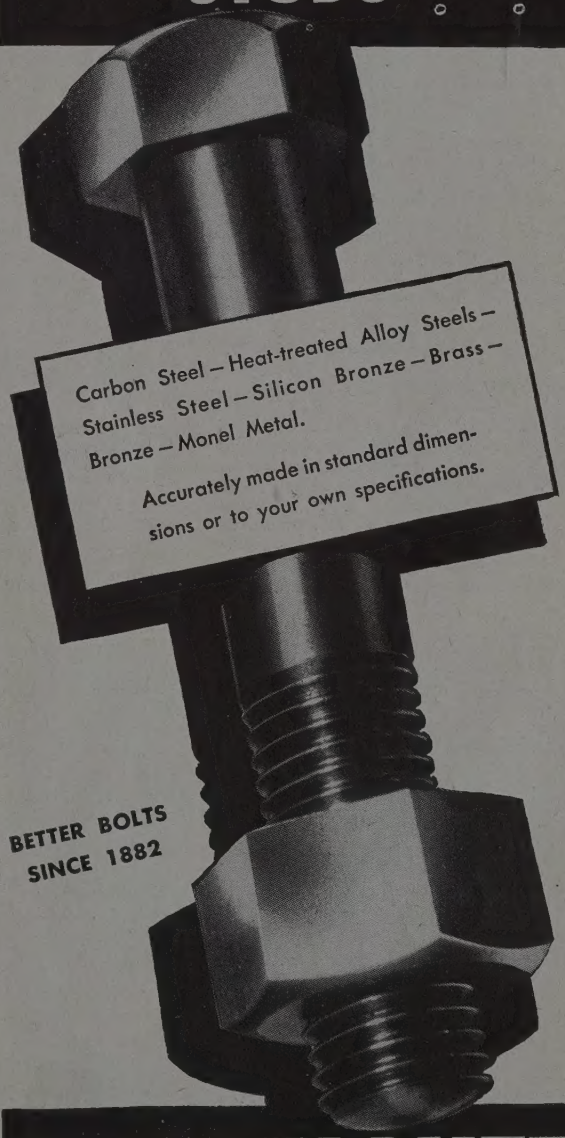

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ton Fairmont ovens and $17.61 delivered Pittsburgh. Similar price action has been taken by Portsmouth Steel Corp., resulting in Portsmouth oven price of $16.

Beehive coke output is back to normal, but most foundries report inadequate inventories of both oven foundry and beehive coke to sustain practical capacity operations, a situation that is further accentuated by relatively poor quality of the limited coke tonnage available.

Cleveland — Delivered price for oven foundry coke has increased here $2 a net ton to $17.90 in line with a similar advance in the Painesville oven price to $16.60. The Ironton, O., oven price has advanced $1 a ton to $15.50 while the Detroit delivered price has advanced to $17.65 and the Buffalo delivered price to $18.25. Supply of coke in this district tightened during the past two months, since the leading merchant producer lengthened its coking time in an effort to improve quality. Scarcity of good coking coal also has been a factor in restricting the flow of coke.

Andrews Steel Defense Corp. Property Declared Surplus

Cincinnati—War Assets Administration announced here that the electric furnace and adjuncts, operated during the war as the Andrews Steel Defense Corp., has been declared surplus. Rated capacity was 190,000 tons a year. The plant adjoins the property of and was operated by the Andrews Steel Co. Division, International Detrola Corp.

Canada . . .

Toronto, Ont. — Canadian production of primary iron and steel shapes in April totaled 277,010 net tons compared with 282,545 tons in March and 248,987 tons in April, 1946. For April, production included 267,166 tons of carbon steel shapes and 9844 tons of alloy steel shapes.

Primary iron and steel shapes shipped for sale during April totaled 206,682 net tons of which 197,344 tons were carbon steel and 9338 tons alloy steel, compared with total shipments of 216,393 tons in March and 201,160 tons in April, 1946. Tonnages involved in shipments for sale do not include the iron and steel shapes delivered to producers' own works for further processing.

During April production of iron and steel shapes included 7240 tons of semi-finished shapes; 12,835 tons of structurals; 17,652 tons of plates; 30,392 tons of rails; 52,717 tons of hot rolled bars; 12,080 tons of pipes and tubes; 14,478 tons of wire rods; 15,109 tons of black sheets; 7487 tons of galvanized sheets; 477 tons of tool steel; 6540 tons of castings and 29,675 tons of other shapes.

Of the shipments made for sale in April, 57,527 tons went direct to railways and railway car shops; 10,882 tons to pressing, forming and stamping plants; 22,318 tons to merchant trade products; 21,660 tons to building construction; 9978 tons to the containers industry; 11,296 tons to agricultural equipment; 9403 tons to the automotive industry; 20,607 tons to the machinery plants; 3468 tons to shipbuilding; 6347 tons to mining, lumbering, etc., and 1889 tons to miscellaneous industries. Wholesalers and warehousing accounted for 26,126 tons and exports for 5154 tons.

In the first four months of this year, production of primary iron and steel shapes totaled 1,084,622 net tons, and shipments, exclusive of producers' interchange, which amounted to 261,705 tons, totaled 839,261 tons, and compares with 970,812 tons produced and 802,916 tons shipped exclusive of producers' interchange of 167,508 tons, in the like period of 1946.

Pressure for More Steel Capacity Seen Increasing

(*Concluded from Page 63*)

specific products.

Then, also, it is reliably reported the President's Council of Economic Advisers has agreed to study the steel supply-demand situation and report its findings well before the end of the year, the chances being President Truman will devote part of his January economic report to the steel situation.

Also, it is understood, Senator James E. Murray (Dem., Mont.) has decided to wait for this report before completing his bill by which, in the absence of action by the steel companies to expand capacity, the government would get behind an expansion program through government investments or loans. Senator Murray plans to introduce this promptly when Congress reconvenes in January and wage a campaign for its enactment.

For some time past government agencies have been recommending that ingot capacity be increased to 100 million tons annually. Present capacity is in excess of 91 million tons. Most steelmakers, however, are of the view existing capacity is sufficient for all normal needs and are averse to adding facilities which may turn into "white elephants" when the present inflated demands of consumers are satisfied.

New sheet and strip mills as well as other facilities are in process of construction and will be coming into production over coming months. However, it will be well into 1948 before supply-demand balance is attained especially in strip and sheets. Consequently, with the supply pinch continuing it is expected consumers will continue to press for enlarged capacity.

Whether the increase in steel prices, just effected, will serve to kill off some of the demand for steel is uncertain.

Distribution policies of the steel companies have been under attack for months. With all lines of consumption seeking more metal than ever before in peacetime the steelmakers have been allocating tonnage, basing allocations on historical purchasing background of consumers with individual mills. Monthly shipment data show that, on the whole, most consuming lines have actually received more metal on a volume basis than prewar. However, consumers complain they are receiving less proportionately of total tonnage produced than before the war. Also, some buyers have been forced to seek new supply sources because of withdrawal of certain mills from market areas.

Exports of steel also have been under criticism. Recently Representative Christian A. Herter of Massachusetts pointed out the United States in 1946 exported nearly 800,000 tons of iron and steel mill products to Europe suitable for use in shipbuilding.

Making the figures public, Representative Herter said that Maritime Commission information on shipbuilding abroad, up to March, this year, showed the countries in Europe receiving this steel and iron were constructing 122 ships "which in tonnage and speed compared very closely with similar vessels now in long supply in the Maritime Commision-owned fleet."

"In other words," said Mr. Herter in a statement to the House, "in this time of great steel scarcity, coal scarcity, and labor scarcity in Europe, we have exported steel from the United States to construct ships of a type of which we have a surplus."

He said it seemed a question as to "whether or not this use of steel does not constitute a terrible economic waste which could be avoided."

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3500 tons, cigarette factory, Liggett & Meyers Tobacco Co., Durham, N. C., to Bethlehem Steel Co., Bethlehem, Pa.

2700 tons, elevated highway, Duane to Barkley Sts., New York city, to Bethlehem Steel Co., Bethlehem, Pa.

2500 tons, decking and additional work in connection with a section of Market St. subway, Philadelphia, through George H. Flinn Corp. New York, general contractors, to Bethlehem Steel Co., Bethlehem, Pa.; this is in addition to 2500 tons noted as placed with this fabricator for this project in the July 21 issue.

1200 tons, Standard Oil refinery project, Bayway, N. J., through Brown & Co. of California, to Lehigh Structural Steel Co., Allentown, Pa.

1000 tons, plant, Continental Can Co., New York, for erection in St. Louis, through Walter Kidde to Bethlehem Steel Co., Bethlehem, Pa.

1100 tons, plant, Continental Can Co., for erection at North Tonawanda, N. Y., through Walter Kidde, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, construction work, Hawaii, for Matson Steamship Co., to a Pacific coast fabricator.

840 tons, Winthrop chemical laboratory, Rensselaer Polytechnic Institute, Troy, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

740 tons, school addition No. 174, Queens, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

570 tons, telephone building, Staten Island, N. Y., through White Construction Co., that city, to Bethlehem Steel Co., Bethlehem, Pa.

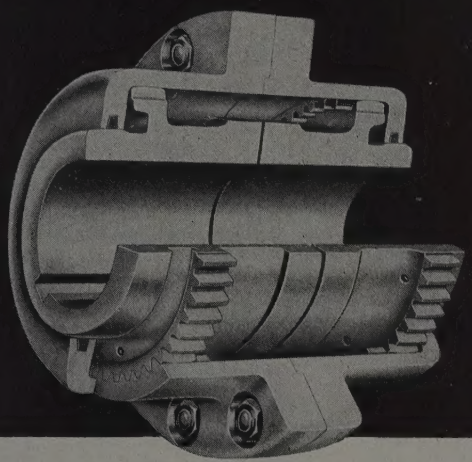
450 tons, surface transportation building, New York city board of transportation, Brooklyn, to Grand Iron Works, New York city.

400 tons, plant addition, Bakelite Co., Bound Brook, N. J., to American Bridge Co., Pittsburgh.

400 tons, N. Y. Central railroad bridges, Albany, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

375 tons, power plant, New England Power

POOLE



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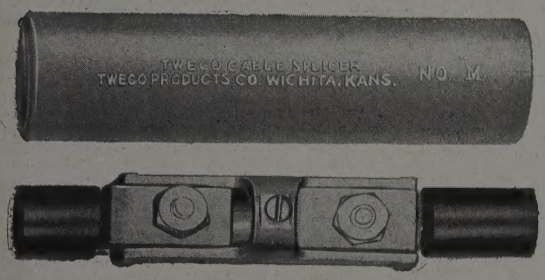

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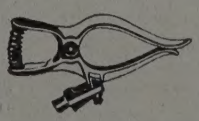

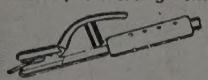

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Co., Boston, to Lehigh Structural Steel Co., Allentown, Pa.

350 tons, Green's Bayou Station, Houston, Texas, to Mosier Steel Co., that city, through Ebasco Services, New York.

310 tons, field house, Rensselaer Polytechnic Institute, Troy, N. Y.; to August Fine & Sons, Buffalo.

250 tons, telephone exchange, Trenton, N. J., through White Construction Co., New York, to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, University of Washington library, Seattle, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

1000 tons, Du Pont plant addition, Orange, Tex.

170 tons, Buckeye Cotton Oil Co., Louisville, Ky., with Day & Zimmerman, Philadelphia, engineers.

100 tons, state bridge, Erie county, Pennsylvania; bids closed Aug. 1.

REINFORCING BARS . . .

REINFORCING BARS PENDING

380 tons, state hospital buildings, Buckley, Wash.; H. R. Olson, Tacoma, Wash., general contractor, low at $1,188,825.

100 tons or more, Washington state highway projects; bids to Olympia Aug. 11.

Unstated, Washington state hospital buildings, $3 million project; bids soon.

Unstated, telephone maintenance building, Eugene, Oreg.; Waale-Camplau Co., Portland, Oreg., low, $77,990.

Unstated, 200,000-gallon water reservoir, Bertha water district, Portland, Oreg.; bids Aug. 11.

PLATES . . .

PLATES PLACED

285 tons, storage tank, Texas Co., for installation at Mt. Vernon, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

PIPE . . .

CAST IRON PIPE PENDING

260 tons, 6 and 4-inch, Bertha water district, Portland, Oreg.; alternative, 19,000 feet, 6-inch steel pipe; bids to M. C. Smith, chairman, Aug. 11.

STEEL PIPE PENDING

Unstated, 5860 feet, 12-inch steel pipe for West Slope district, Portland, Oreg., bids Aug. 11 to W. D. Cameron, chairman; also for pumping station and equipment, J. W. Cunningham, Portland, Oreg., engineer.

RAILS, CARS . . .

RAILROAD CARS PLACED

Gulf, Mobile & Ohio, 300 fifty-ton welded box cars, and 100 fifty-ton high-side gondolas to American Car & Foundry Co., New York.

New York Central, 1000 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Michigan City, Ind.

Reading Co., 1000 box cars, to American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Atlantic Coast Line, 4000 freight cars, including: 1000 double-door box cars, 1000 single-door box cars, 500 high-side gondolas, 100 low-side gondolas, 500 hopper-bottom coal cars, 100 flat cars, 100 pulpwood cars, 100 port phosphate rock cars, 100 cement hopper cars.

Chicago, Indianapolis & Louisville, 100 seventy-ton covered hoppers.

Delaware, Lackawanna & Western, 500 fifty-ton box cars.

LOCOMOTIVES PLACED

Long Island Railroad, 5 diesel electric switch engines, awarded to unnamed builder.

Nickel Plate road, eleven 2000-horsepower diesel passenger locomotives, to American Locomotive Co.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Collins & Hamilton Equipment Co. Inc. has been formed by Harry C. Collins and associates with a capital of $100,000 to manufacture all types of machinery, machine tools and parts. Firm is represented by Wolfon & Essey, 711 Citizens National Bank Bldg.

LOS ANGELES—Tom Collins Mfg. Co. has been incorporated with a capital of $200,000 by Thomas J. Collins and associates to manufacture, construct and deal in mechanical devices and machinery. Firm is represented by Gatz & Aikens, 714 W. Olympic Blvd.

LOS ANGELES—Holdfast Tool Co. Inc. has been formed by Robert B. Smith with a capital of $200,000. Firm is represented by Teschke, Rohe & Petty, 204 S. Beverly Dr., Beverly Hills, Calif.

LOS ANGELES—Kruse Metal Mfg. Co., 1349 Channing St., has been formed by William Kruse and Edward H. Kruse.

RIVERSIDE, CALIF.—Pacific Telephone & Telegraph Co. has purchased a site here at Sixth and Orange Sts. for a proposed $2,225,000 building.

RIVERSIDE COUNTY, CALIF.—Kaiser Co. Inc., Oakland, has awarded a joint contract amounting to $2,300,000 for construction of 52 miles of standard gage railroad to connect Kaiser's Eagle Mountain iron mine with Southern Pacific tracks. Firms receiving the contract are General Construction Co., Seattle; J. G. Shea Co., Los Angeles; and Pacific Bridge Corp., San Francisco.

SAN FRANCISCO—Schlage Lock Co., 2201 Bayshore St., has awarded a $78,500 contract to Cahill Bros., 206 Sansome St., for a plant at Bayshore and Blanken Sts.

CONNECTICUT

BRISTOL, CONN.—Bristol Brass Corp., Broad St., has awarded a $60,000 contract to Spart Carpenter, Gaylord St., for a 1-story factory. Architects are Westcott & Mapes Inc., 109 Church St., New Haven.

NEW MILFORD, CONN. — Acme Corp., Meadow and Bogart Sts., Brooklyn, N. Y., will spend $392,000 on a factory, boiler plant and pumphouse.

STAMFORD, CONN.—Air Reduction Sales Corp., 60 E. 42nd St., New York, has awarded a $152,000 contract to W. J. Barnery Corp., 101 Park Ave., New York, for a 1-story factory and office on Betts Ave.

WATERTOWN, CONN.—Waterbury Rolling Mills, Watertown Ave., has awarded a $60,000 contract to Torrington Bldg. Co., 187 Church St., Torrington, for a plant addition.

ILLINOIS

McCOOK, ILL.—Armour & Co. will build a manufacturing plant here to cost about $2 million.

SUMMIT, ILL.—Mojonnier Bros. Co., 4601 Ohio St., Chicago, has awarded a $155,000 contract to A. B. Larson, 3837 Lake St., Chicago, for a 1-story factory. Architect is C. W. Lampe, 601 N. St. Clair St., Chicago.

KANSAS

WICHITA, KANS.—Forster Mfg. Co., 463 N. Seneca St., will build a $100,000 factory. Plans are by Forsblom & Parks, Beacon Bldg.

MICHIGAN

DETROIT—Apex Foundry Co., 170 Mt. Elliot Ave., has let a $125,000 contract to Austin Co., 227 Curtis Bldg., for design and construction of a foundry.

JACKSON, MICH.—Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, plans to build a $148,000 power house addition.

LANSING, MICH.—Atlas Drop Forge Co., 209 W. Mt. Hope St., has awarded a $98,500 contract to A. Bentley & Sons Co., 201 Belmont St., Toledo, O., for a 1-story plant addition.

NEW JERSEY

TRENTON, N. J.—Sloan-Blabon Corp., Bear Swamp Rd., has awarded separate contracts totaling $1,373,000 for a project to include offices and manufacturing space. Engineer is Walter Kidde Constructors Inc., 140 Cedar St., New York.

WASHINGTON

SEATTLE—Salmon Bay Foundry Co. was damaged by a fire recently.

CANADA

BELLEVILLE, ONT.—American Optical Co. of Canada Ltd., 224 Front St., will build a $600,000 plant unit and office. Architects are Mathers & Haldenby, 15 St. Marys St., Toronto.

BELLEVILLE, ONT.—Northern Electric Co. Ltd., 1600 Notre Dame St. W., Montreal, has awarded a $1 million contract to E. G. M. Cape & Co. Ltd., 620 Carthcart St., Montreal, for construction of a 1-story plant.

BELLEVILLE, ONT.—Bakelite Co. (Canada) Ltd., 163 Dufferin St., plans to build a $600,000 plant.

CENTRAL PATRICIA, ONT.—Central Patricia Gold Mines Ltd., 85 W. Richmond St., Toronto, plans to build a $100,000 mining development.

CHIPPAWA, ONT. — Norton Co. Ltd. has awarded a $561,000 contract to MacDonald Engineering Co. Ltd., C. P. R. Bldg., Toronto, for a plant expansion program.

TORONTO, ONT.—Gair Co. (Canada) Ltd., 372 Bay St., will build a $3 million factory in York township. Architect is A. G. Facey, 991 Bay St.

TORONTO, ONT.—Ginsberg Bros., 88 Adelaide St. W., are having plans prepared by E. I. Richmond, 455 Spadina Ave., for a 2-story, $60,000 factory.

TORONTO, ONT.—W. R. Warner Co. Ltd., 727 King St. W., will build a $650,000 plant addition. Plans are by N. A. Armstrong, 19 Melinda St.

TORONTO, ONT.—Eastman Kodak Inc., 343 State St., Rochester, N. Y., will build a $250,000 6-story plant addition here.

TORONTO, ONT.—Jalore Mining Co. Ltd., c/o J. Gwyn Osler, 25 W. King St., plans a $100,000 mining development.

TORONTO, ONT.—Toronto Elevators Ltd., Queens Quay, will build a plant to cost $1,100,000 including equipment.

VIRGINIATOWN, ONT.—Kerr-Addison Gold Mines Ltd., W. S. Raw, manager, has awarded a $600,000 contract to Hill-Clark-Francis Ltd., Ninth St., Noranda, Que., for construction of a mill addition, screen house, power house, and pumping station.

WINDSOR, ONT.— DeVilbis Co., Toledo, plans to build a $250,000 plant here.

BEAUHARNOIS, QUE.—Dominion Alkali & Chemical Co. Ltd. has awarded a $4 million contract to H. K. Ferguson & Co., 19 Rector St., New York, for construction of a chlorine manufacturing plant.

BOURLAMAQUE, QUE. — Mistassini Lead Corp. Ltd. is completing plans for a $200,000 mining development here.

CAP DE LA MADELEINE, QUE.—National Lead Corp., c/o F. W. Rockwell, 111 Broadway, New York, plans to build a $5 million titanium dioxide plant here.

MISTASSINI, QUE.—Mistassini Explorations Ltd. is completing plans for a $100,000 mining development program.

MONTREAL, QUE.—Zinc Oxide Co. of Canada Ltd., 6894 Notre Dame St. E., will build a $300,000 plant bounded by Hachelaga, Lyall and Hays Sts. Plans are by L. Venne, 3607 St. Denis St.

SHAWINIGAN FALLS, QUE. — Canadian Resins & Chemicals Ltd., Blvd. de Cedres, has awarded a $125,000 contract to E. D. Lavergne, 48 Fifth Ave., for an office building. Architect is A. Lacoursiere, 101 Fourth St.

ST. JOHNS, QUE.—Singer Sewing Mfg. Co. Ltd., St. Paul St., Montreal, is having plans prepared for a 1-story, $100,000 factory here. Architect is E. C. Miller, 485 McGill St., Montreal.